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ENVIRONMENTAL IMPACT STATEMENT
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LAND AND RESOURCE MANAGEMENT PLAN

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Type of Action Administrative

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Abstract

This Final Environmental Impact Statement (EIS) supercedes the 1985 Revised Draft EIS developed for the Beaverhead National Forest Land Management Plan. This EIS documents the analysis and discloses the significant environmental effects of a Proposed Action and twelve other alternatives for the future management of land and resources of the Beaverhead Forest. These alternatives include a "no action" alternative. All alternatives provide various combinations of management prescriptions, resulting in different levels of resource goods and services. Alternative S is the Proposed Action. The selected alternative will become the Forest Plan and will guide management of the Forest for the next ten to fifteen years.

The Beaverhead National Forest comprises approximately 2.1 million acres in southwestern Montana, located in portions of Beaverhead, Madison, Silver Bow, Gallatin, and Deer Lodge Counties.

Date of Transmission to Environmental Protection Agency and the Public

READEX FICHE

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SUMMARY

This summary is a synopsis of the Final Environmental Impact Statement (EIS) for the Beaverhead National Forest Plan. Chapters I-IV are summarized.

I. Purpose and Need (Chapter I)

This EIS describes proposed and alternative actions for future management of the land and resources of the Beaverhead National Forest. It documents the analysis and discloses the environmental consequences of implementing each alternative. The proposed action is the basis for the Proposed Forest Land and Resource Management Plan (Forest Plan).

Development of this EIS followed direction from the Forest and Rangeland Renewable Resources Planning Act (RPA), National Forest Management Act (NFMA), National Environmental Policy Act (NEPA), and implementing regulations of NFMA (36 CFR 219) and NEPA (40 CFR 1500-1508).

A. Planning Area

The Forest contains approximately 2,147,521 acres located in southwestern Montana, immediately east of the Continental Divide. Forest land makes up much of the headwaters of the Big Hole, Madison, and Beaverhead Rivers which eventually combine to form the Jefferson and Missouri Rivers. The Forest is located in portions of several mountain ranges including the Beaverhead, Madison, Tobacco Root, Gravelly, Pioneer, Snowcrest, and Fleecers. The majority of the Forest is located in Beaverhead and Madison Counties with smaller amounts in Silverbow, Gallatin, and Deerlodge Counties. District offices are located in Wisdom, Dillon, Wise River, Ennis, and Sheridan, Montana. The Supervisor's Office is located in Dillon, Montana.

B. Issues, Concerns, and Opportunities

Seven major public issues guide planning activities. These were identified by individuals, organizations, and agencies who participated in public involvement activities for the Forest Plan. Issues were first identified in 1980 and additional public involvement was initiated in 1983 to aid in the inventory and evaluation of the wilderness attributes of 1,246,000 roadless acres. A Revised Draft EIS was issued in 1985 and public comment again solicited. This EIS incorporates changes occuring in response to that comment.

The major issues addressed by this planning effort are:

1. How much of the forage produced on the Beaverhead National Forest should be used by domestic livestock? What constraints should be applied to the domestic use of forage?

2. What areas should be managed for a continuous supply of timber products? When and where should timber harvests be scheduled?

3. To what degree should the various recreation opportunities be made available for public use?

4. What actions are necessary to provide wildlife habitat to meet elk and fish objectives established in cooperation with Montana Department of Fish, Wildlife and Parks?

5. What additional road rights-of-way are needed to provide reasonable public access to National Forest System lands buffered by private ownership?

6. What effects will proposed land use and management of surface resources have on access for exploration and development of mineral and energy resources? How should effects that make access difficult or costly be considered when assigning proposed land uses?

7. What inventoried roadless areas should be recommended for wilderness? Are there portions of inventoried areas that should be excluded from recommendation because of conflicting uses or new information? Of the inventoried roadless areas not recommended for wilderness, how should these areas be managed?

II. **Alternatives** (Chapter II)

Once the issues were identified, information was needed to determine the Forest's capability to respond to the issues. This was done in an analysis of the management situation which included resource data, economics information, and environmental and legal constraints to establish a basis for the range of alternatives.

Resource supply potentials were determined by establishing minimum and maximum production levels called benchmarks using the FORPLAN computer model. Laws and regulations that require measures to prevent significant impairment of the productivity of the land were identified as constraints which reduced the supply potential in the range of alternatives.

Thirteen alternatives were considered in detail. Alternatives S and Sa were developed in response to public comment between the Revised Draft EIS, and the Final EIS. Each alternative has various levels of timber harvest, road construction, livestock grazing, fish and wildlife habitat, wilderness, roadless recreation uses, and other activities. The difference between alternatives reflects the intensity of management and amount of area managed for each activity or mix of activities. Each alternative has an objective of maximizing present net value after meeting other resource objectives. All alternatives are considered implementable within the resource capability of the Forest.

The West Pioneers (roadless area 1006) is a Montana Wilderness Study Act (MWSA) area. The MWSA EIS evaluated both wilderness and nonwilderness options for the area. The Forest Service recommended nonwilderness. The site specific analysis and recommendation of Forest Service has been carried through all alternatives presented in this EIS. Most alternatives reflect a variety of nonwilderness land uses including timber management, roadless recreation and intensive livestock grazing. Alternatives H and S propose to manage the area in a custodial status until Congress acts on the Forest Service recommendation. Custodial management would be designed to prevent changes to the area which would decrease wilderness potential.

A. Alternative A (Current level of Management)

The goal of this alternative is to continue the management direction provided by the 1978 Beaverhead Land Management Plan. The alternative was constrained to a budget level equal to the average budget received on the Forest in fiscal years 1980 through 1982. The current level alternative meets the NEPA and NFMA requirements for a "no action" alternative, exhibiting no change from existing direction for resource production and management.

Approximately 13 percent of the Forest's inventoried roadless acres are recommended for wilderness classification and reflect the recommendations of RARE II.

The alternative maintains the current scheduled timber harvest program of 29.4 MMBF per year on a scheduled timber base of 535,000 acres. The long-term sustained yield is 31.3 MMBF per year. Approximately 3,550 additional miles of road are needed to complete the Forest transportation system over the next 50 to 70 years.

The available domestic livestock forage in the first decade equals the current use of 190,000 AUMs per year. Effective security cover for elk is reduced by 18 percent in the first five decades. Potential stream trout populations increase from the existing level of 324,000 to 334,000 in the first decade, but decline slightly to 326,500 by decade five.

B. Alternative B

The goal of this alternative is to achieve high commodity resource production levels. This alternative is responsive to the 1980 RPA Program objectives. This alternative does not recommend classification of additional wilderness for the Forest.

The alternative attempts to meet or exceed RPA goals for timber production and maintains a scheduled timber harvest program of 33.8 MMBF per year on a scheduled timber base of 653,000 acres. The long-term sustained yield is 49.2 MMBF per year. Approximately 4,324 additional miles of road are needed to complete the Forest transportation system over the next 50 to 70 years.

The available domestic livestock forage in the first decade is 184,000 AUMs per year. Effective security cover for elk is reduced by 25 percent in the first five decades. Potential stream trout populations increase from the existing level of 324,000 to 334,800 in the first decade, then decline slightly to 331,500 by decade five.

C. Alternative C

The goal of this alternative is to provide both a significant acreage of roadless areas recommended for wilderness and a significant production level for commodity resources from the remainder of the Forest.

Wilderness classification is recommended for 75 percent of the inventoried roadless acres on the Forest.

The alternative maintains a scheduled timber harvest program of 25.8 MMBF per year in the first decade on a scheduled timber base of 537,000 acres. The long term sustained yield is 42.3 MMBF per year. Approximately 3,570 additional miles of road are needed to complete the Forest transportation system over the next 50 to 70 years.

The available domestic livestock forage in the first decade is 182,000 AUMs per year. Effective security cover for elk is reduced by 22 percent in the first five decades. Potential stream trout populations increase from the existing level of 324,000 to 334,400 in the first decade, then decline slightly to 326,600 by decade five.

D. **Alternative D**

The goal of this alternative is to emphasize recreation opportunities and the protection and maintenance of elk habitat. This alternative focuses on the amenity resources, such as recreation and wildlife, by restricting timber harvest to areas that have already been developed and by recommending wilderness classification for a large number of acres.

Wilderness classification is recommended for 62 percent of the inventoried roadless acres on the Forest.

The alternative maintains a scheduled timber harvest program of 18.8 MMBF per year in the first decade on a scheduled timber base of 313,000 acres. The long term sustained yield is 18.6 MMBF per year. Approximately 1,965 additional miles of road are needed to complete the Forest transportation system over the next 50 to 70 years.

The available domestic livestock forage in the first decade is 186,000 AUMs per year. Effective security cover for elk is reduced by 9 percent in the first five decades. Potential stream trout populations increase from the existing level of 324,000 to 337,100 in the first decade, then decline slightly to 335,600 by decade five.

E. **Alternative F**

The goal of this alternative is to emphasize wildlife habitat improvement activities including timber harvest designed to enhance or maintain habitat components. This alternative also provides for timber harvest and livestock forage utilization where suitable. Where roadless area resource values, especially wildlife, can be best managed through wildeness classification, wilderness is recommended.

Wilderness classification is recommended for 36 percent of the inventoried roadless acres on the Forest.

The alternative maintains a scheduled timber harvest program of 36.2 MMBF per year in the first decade on a scheduled timber base of 609,000 acres. The long term sustained yield is 35.3 MMBF per year. Approximately 4,103 additional miles of road are needed to complete the Forest transportation system over the next 50 to 70 years.

The available domestic livestock forage in the first decade is 192,000 AUMs per year. Effective security cover for elk is reduced by 17 percent in the first five decades. Potential stream trout populations increase from the existing level of 324,000 to 334,000 in the first decade, then decline slightly to 330,700 by decade five.

F. Alternative G

The goal of this alternative is to impose few constraints that detract from opportunities to manage in a cost efficient manner. Recommended additions to the wilderness system are limited to small areas adjacent to existing wilderness areas, or contiguous with areas recommended for wilderness by other Forests.

Wilderness classification is recommended for 5 percent of the inventoried roadless acres on the Forest.

The alternative maintains a scheduled timber harvest program of 43.6 MMBF per year in the first decade on a scheduled timber base of 548,000 acres. The long-term sustained yield is 41.2 MMBF per year. Approximately 3,550 additional miles of road are needed to complete the Forest transportation system over the next 50 to 70 years.

The available domestic livestock forage in the first decade is 185,000 AUMs per year. Effective security cover for elk is reduced by 18 percent in the first five decades. Potential stream trout populations increase from the existing level of 324,000 to 335,100 in the first decade, then decline slightly to 329,300 by decade five.

G. Alternatives H and Ha

The goal of these alternatives is to respond to the resource use demands and concerns of the public who utilize the Forest land and resources. These alternatives meet the demand for dispersed and developed recreation and respond to concerns for wilderness classification in more popular roadless areas. These alternatives schedule early decade timber harvest activities in areas highly susceptible to mountain pine beetle infestations. Elk habitat, and effective security cover is maintained throughout the Forest.

Wilderness classification is recommended for 13 percent of the inventoried roadless acres on the Forest.

Due to the unresolved status of the Montana Wilderness Study Act, the West Pioneer roadless area was considered both for undeveloped management to protect the wilderness potential of the area and for nonwilderness designation. Alternative H retains the area in a custodial management prescription while alternative Ha proposes to manage the area for a variety of nonwilderness uses, including a core recreation management area of approximately 62,000 acres.

Alternative H maintains a timber harvest program of 20.6 MMBF per year in the first decade which rises to 26.1 in the second decade. Harvesting is scheduled on a regulated timber base of 379,000 acres. The long-term sustained yield is 33.3 MMBF per year. Approximately 2,452 additional miles of road are needed to complete the Forest transportation system over the next 50 to 70 years.

The available domestic livestock forage in the first decade is 192,000 AUMs per year. Effective security cover for elk is reduced by 15 percent in the first five decades. Potential stream trout populations increase from the existing level of 324,000 to 337,800 in the first decade, then decline slightly to 336,900 by decade five.

Alternative Ha maintains a scheduled timber harvest program of 23.8 MMBF per year in the first decade which rises to 29.1 MMBF in the second decade. Harvest is scheduled on a regulated timber base of 434,000 acres. The long-term sustained yield is 37.1 MMBF per year. Approximately 2,929 additional miles of road are needed to complete the Forest transportation system.

The available domestic livestock forage in the first decade is 191,000 AUMs per year. Effective security cover for elk is reduced by 17 percent in the first five decades. Potential stream trout populations increase from 324,000 to 336,600 in the first decade, then decline slightly to 335,800 by decade five.

H. **Alternative H** (departure)

The goal of this alternative is to duplicate the goals and objectives of alternative H while incorporating a departure timber harvest schedule. The major purpose of the departure is to accelerate harvest of mature lodgepole pine stands to minimize mortality from a highly probable mountain pine beetle epidemic. This level of accelerated harvest is not possible if non-declining flow constraints are used.

Wilderness classification is recommended for 13 percent of the inventoried roadless acres on the Forest.

The alternative maintains a departure harvest schedule as shown in the following table:

DECADE	HARVEST IN MMBF
1	31.6
2	38.1
3	35.6
4	28.8
5	31.6
6	23.0
7	14.4
8	14.4
9	21.8
10	36.2

The proposed harvest schedule occurs on a regulated timber base of 379,000 acres. The long term sustained yield is 40.2 MMBF per year. Approximately 2,490 additional miles of road are needed to complete the Forest transportation system over the next 50 to 70 years.

The available domestic livestock forage in the first decade is 199,000 AUMs per year. Effective security cover for elk is reduced by 18 percent in the first five decades. Potential stream trout populations increase from the existing level of 324,000 to 336,600 in the first decade, then decline slightly to 334,000 by decade five.

I. Alternative I

The goal of this alternative is to recommend all inventoried roadless areas for wilderness classification while maximizing opportunities to manage commodity resources in a cost efficient manner on the roaded portion of the Forest. This alternative was developed as a maximum wilderness benchmark, was considered implementable and was brought forward in the analysis as an alternative.

Wilderness classification is recommended for 100 percent of the inventoried roadless acres on the Forest.

The alternative maintains a scheduled timber harvest program of 28.2 MMBF per year in the first decade on a scheduled timber base of 347,000 acres. The long term sustained yield is 25.7 MMBF per year. Approximately 2,225 additional miles of road are needed to complete the Forest transportation system over the next 50 to 70 years.

The available domestic livestock forage in the first decade is 178,000 AUMs per year. Elk effective cover is reduced by 12 percent in the first five decades. Potential stream trout populations increase from the existing level of 324,000 to 337,800 in the first decade, then decline slightly to 337,200 by decade five.

G. Alternative S and Sa (Proposed Action)

These alternatives were developed from alternatives H and Ha, presented as the Proposed Action in the Revised Draft EIS. Alternatives S and Sa incorporate changes made in response to public comment of the Revised Draft and are now presented as the Proposed Action. The general goals of these alternatives remain the same as alternatives H and Ha however alternative methods of achieving those goals or achievement at different levels has been presented. The goals are to respond to the resource use demands and concerns of the public who utilize the Forest land and resources. These alternatives meet the demand for dispersed and developed recreation and respond to concerns for wilderness classification in more popular roadless areas. These alternatives schedule early decade timber harvest activities in areas highly susceptible to mountain pine beetle infestations. Elk habitat, and effective security cover is maintained throughout the Forest.

Wilderness classification is recommended for 14 percent of the inventoried roadless acres on the Forest.

Due to the unresolved status of the Montana Wilderness Study Act, the West Pioneer roadless area was considered both for undeveloped management to protect the wilderness potential of the area and for nonwilderness designation. Alternative S retains the area in a custodial management prescription while alternative Sa proposes to manage the area for a variety of nonwilderness uses, including portions of a core recreation area of approximately 101,000 acres. The size of this recreation managment area is considerably larger than that proposed in alternative Ha.

Alternative S maintains a timber harvest program of 17.3 MMBF per year in the first decade which rises to 21.2 in the second decade. Harvesting is scheduled on a regulated timber base of 338,000 acres. The long-term sustained yield is 32.1 MMBF per year. Approximately 2,143 additional miles of road are needed to complete the Forest transportation system over the next 50 to 70 years.

The available domestic livestock forage in the first decade is 190,000 AUMs per year. Effective security cover for elk is reduced by 12 percent in the first five decades. Potential stream trout populations increase from the existing level of 324,000 to 337,900 in the first decade and to 341,100 by decade five.

Alternative Sa maintains a scheduled timber harvest program of 18.1 MMBF per year in the first decade which rises to 23.0 MMBF in the second decade. Harvest is scheduled on a regulated timber base of 360,000 acres. The long-term sustained yield is 34.5 MMBF per year. Approximately 2,302 addtional miles of road are needed to complete the Forest transportation system.

The available domestic livestock forage in the first decade is 189,000 AUMs per year. Effective security cover for elk is reduced by 12 percent in the first five decades. Potential stream trout populations increase from the existing level of 324,000 to 337,900 in the first decade and to 339,800 by decade five.

J. **Alternative W**

The goal of this alternative is to emphasize wildlife habitat protection and enhancement. In addition, roadless areas which have received substantial support from environmental groups are recommended for wilderness classification. This alternative also provides for timber harvest and livestock forage utilization where suitable.

Wilderness classification is recommended for 25 percent of the inventoried roadless acres on the Forest.

The alternative maintains a scheduled timber harvest program of 37.6 MMBF per year in the first decade on a scheduled timber base of 616,000 acres. The long term sustained yield is 35.7 MMBF per year. Approximately 4,154 additional miles of road are needed to complete the Forest transportation system over the next 50 to 70 years.

The available domestic livestock forage in the first decade is 195,000 AUMs per year. Elk effective cover is reduced by 17 percent in the first five decades. Potential stream trout populations increase from the existing level of 324,000 to 334,000 in the first decade, then decline slightly to 330,700 by decade five.

K. Net Public Benefit, Present Net Value, and Nonpriced Benefits

Net public beneft is the total value to society of all outputs and positive effects (benefits) less all inputs and negative effects (costs) of managing the Beaverhead National Forest. Thus, net public benefit represents the sum of Present Net Value (PNV) plus the value of nonpriced outputs. PNV is the present value of all monetary benefits less all costs of managing the Forest over a 150 year planning horizon. Benefits in PNV calculations include timber, range, and RVD's. Nonpriced benefits include all impacts or outputs that cannot be assigned a monetary value. These include visual quality, community stability, diversity of recreation experiences, and so on. The goal of Forest planning is to provide Information that helps decisionmakers to maximize the net public benefit of managing the Forest.

On the Beaverhead, timber values and recreation RVD values make up the bulk of PNV; as timber production increases, PNV increases. The timber and associated road program also make up most of the costs. Managing for other, nonpriced resources (addressing other issues) reduces PNV for three reasons: 1) the suitable timber base is reduced, 2) constraints imposed on timber harvest reduce volume outputs and/or increase costs, and 3) efficiency of timber management is reduced.

There are some resource values that have not been quantified and included in the calculation of PNV because of the speculation that would have to be involved. These include mineral values and water quantity.

Generally community stability is enhanced by alternatives that maintain the existing levels of resources produced from the Beaverhead and that increase or at least maintain the diversity of use opportunities.

The future value to society of this Forest will depend upon the mix of economic and other values that are produced, the costs of managing the Forest, and the ways in which society's use of and relationship to the Forest change. Judgements of the various mixes associated with the alternatives may differ, depending upon the reviewers' values, interests, and life styles. Generally, on the Beaverhead, production of priced resource values conflicts to some degree with production and protection of nonpriced resources, even where compatibility can be achieved and environmental costs avoided, management's financial costs increase. The alternatives all provide a different mix of relationships between the priced resources available on the Beaverhead and the available nonpriced resources.

III. Affected Environment (Chapter III)

A. General Setting

The Forest protection boundary comprises approximately 2,218,683 acres, of which approximately 70,000 acres are in other than Forest Service jurisdiction, including State of Montana, Bureau of Land Management, Plum Creek Timberlands, and small private ownerships.

The Forest is relatively undeveloped. Approximately 66 percent of the Forest remains unroaded or accessed only by jeep trails. Major local industries include farming, ranching, mining, and tourism.

B. Recreation

The Forest provides a wide range of recreation opportunities for the Forest visitor including camping, fishing, hiking, hunting, backpacking, picnicking, snowmobiling. The Forest contains 30 developed campgrounds, 4 picnic areas, and 5 boating sites. The Maverick Mountain Ski Area is located on Forest land in the Grasshopper Creek drainage.

C. Cultural Resources

The Forest and adjacent area has a rich and varied cultural history. Prehistoric sites include game traps, buffalo jumps and tepee rings. The Lewis and Clark expedition passed through the area in 1805 and 1806, crossing the Continental Divide near Lemhi Pass. Montana's first major gold strike occurred near the present site of Bannack, which later became the first Montana Territorial Capital. The National Bighole Battlefield is located adjacent to the Forest.

D. Wilderness, Roadless, and Special Areas

Portions of two Wilderness areas are contained within the Forest boundary. Approximately 72,526 acres of the Anaconda-Pintler Wilderness is located in the northwestern part of the Forest along the continental divide. In 1983, the Lee Metcalf Wilderness Bill designated over 101,000 acres of the Forest in the Madison Range as wilderness. These areas contain a wide variety of features including open willow bottoms, dense forest, high mountain peaks and many lakes. In addition to the designated wilderness, much of the Forest remains roadless and undeveloped. Approximately 1,246,000 acres are inventoried as roadless and qualify for wilderness classification.

E. Visual Quality

Much of the Forest maintains a natural or near-natural appearance. Although the Forest is transected by and viewed from many miles of highways and primary roads, most of the management activities which affect the visual character of the landscape have occurred in less visually sensitive areas.

F. Wildlife

Many species of birds, small mammals, and furbearers inhabit the Forest along with sizeable populations of elk, moose, mountain goat, bighorn sheep, whitetail deer, mule deer, and black bear. The elk herd of about 12,000 animals is of national significance and is heavily hunted by both in-state and out-of-state hunters.

The Forest currently provides habitat for the endangered bald eagle and gray wolf, the threatened grizzly bear, and potential habitat for the endangered peregrine falcon.

G. Fish

The Forest contains over 1,000 miles of fishable streams and 155 lakes. Fish species occurring in these waters include cutthroat, rainbow, German brown, eastern brook, and golden trout, as well as arctic grayling and mountain whitefish. The area surrounding the Forest contains the Madison, Bighole, and Beaverhead Rivers which are nationally recognized "Blue Ribbon" trout streams. Many of the tributaries to these larger streams are located on the Forest and provide spawning and rearing habitat for many fish which are later recruited to these downstream fisheries. The water quality and quantity of both on-Forest and downstream fisheries are affected by management activities occurring on Forest lands.

H. Range

Grazing of domestic livestock (primarily cattle), is a major use of the Forest. The Forest currently provides 190,000 AUMs of permitted use on 574,000 acres of permanent rangeland and 12,000 acres of transitory range.

I. Timber

Forty percent of the Forest is classified as potentially suitable timber land. The majority of the commercial stands of timber are composed of lodgepole pine; however, lesser amounts of commercial Douglas-fir and spruce also occur. Productivity on the Forest is considered low to moderate. Volume growth ranges between 20 and 80 cubic feet per acre per year, with an estimated mean of 35 cubic feet per acre per year.

A large proportion of the existing timber stands currently exiting on the Forest exceed 100 years of age. These mature stands have a high incidence of, and susceptibility to insects and disease, including dwarf mistletoe in the lodgepole pine and spruce budworm in the Douglas-fir. A mountain pine beetle epidemic is currently centered in the Madison Valley, and has a high probability of extending into other portions of the Forest in the next decade. The potential for significant mortality of lodgepole pine is great.

Regulated timber offered for sale on the Forest has averaged 26 - 35 MMBF per year since 1978. Due to a depressed timber market, the amount of timber actually sold during that period was somewhat less, averaging between 20 and 29 million board feet per year.

J. Watershed

Approximately 2.5 million acre-feet of water flow from the Forest to the Missouri River system during an average year. Water originating on the Forest is used to irrigate much of the farmland in the Bighole, Madison, and Beaverhead River drainages. Three municipal watersheds on the Forest provide domestic water for Dillon, Butte, and Sheridan, Montana. Watershed conditions are considered good and water quality is high on the Forest. Sediment is the major water quality variable affected by management activities. Activities which increase sedimentation include livestock grazing, timber harvest, and road construction.

K. Minerals

The Forest contains significant mineral resources. The location, identification, development, and production of these resources have historically played a major role in the development of the area, and are expected to play an important role in the future. Minerals occuring on the Forest include talc, molybdenum, tungsten, thorium, iron, gold, silver, copper, lead, zinc, silica, gypsum and phosphate. Significant potential for oil and gas reserves occurs on the Forest, and exploration is currently taking place.

L. Facilities

Approximately 1,685 miles of road comprise the Forest transportation system, including 1,100 mile of local road and 585 miles of arterial and collectors. Approximately 950 miles are maintained regularly, while 735 miles remain in primitive condition. Public access to the Forest is limited in many areas due to the location of private land between public roads and the Forest boundary. The Forest is continuing a program of acquiring rights-of-way across these private lands to increase public access to the Forest. The Forest also maintains 1,587 miles of trail used for horseback riding, trail bike riding, backpacking, and the movement of livestock.

The Forest, in cooperation with other government agencies, maintains an interagency travel plan. This plan provides for the closure and/or use restriction of many roads and trails on the Forest on a seasonal or yearlong basis. Closures and restrictions provide for the protection of wildlife, to prevent erosion, or for the protection of the roadbed or trail.

M. Protection

Fires, insects and disease will continue to play a major role in the development of the Forest. Current policy conditionally allows wildfire to play a natural role in some designated wildernesses. Controlled burning occurs outside wilderness to accomplish management goals of site preparation, reductions of logging slash and to stimulate forage species for use by domestic livestock and wildlife.

Insects and disease continue to decrease the potential growth of the forest. Significant growth loss and mortality is occurring in commercial forest stands from the presence of such agents as dwarf mistletoe, needle casts, root rots, western spruce budworm and mountain pine beetle. Current management activities are designed to reduce the effects of these agents.

IV. Environmental Consequences (Chapter IV)

Environmental consequences are the potential affects of activities scheduled to implement an alternative. They are described as quantitative or qualitative changes from the current situation in terms of significance, magnitude, and duration.

A. Wilderness

The establishment of new wilderness areas precludes timber harvest and restricts mineral production and domestic livestock grazing. Some areas currently receiving use by motorbikes and snowmobiles would no longer be available for that use.

Wilderness classification assures the continued availability of dispersed recreation opportunities, and allows the natural ecosystems to function relatively undisturbed.

B. Roadless

Within areas maintained as roadless, the possibility of intensive wildfires is increased due to the buildup of natural fuels. Although roadless designations do not preclude mineral exploration or development, those activities are limited by the lack of access. Areas currently receiving off-road vehicle use will remain available for that use where consistent with the Interagency Travel Plan. Wildlife and range resources may be improved in these areas through the development of wildlife and range improvement projects.

C. Developed Recreation

The small amount of area occupied by developed recreation sites has little effect on other natural resources; however, the recreational use generated by these areas benefits local business. This is especially true of the Maverick Mountain Ski Area which is located on Forest land.

D. Dispersed Recreation

The majority of the dispersed recreation use on the Forest occurs during hunting season. This use of the Forest has little effect on other natural resources but generates a great deal of business for the local economy.

E. Cultural Resources

Where ground-disturbing activities are planned, a cultural inventory will be completed prior to implementation. Some ground-disturbing activities may inadvertently enter and disturb some previously unidentified cultural sites. Should this happen, the disturbing activity will be curtailed until an evaluation is conducted.

F. Wildlife Habitat

Measures designed to mitigate the effect of management activities on the wildlife resource include timing of timber harvest activities to provide security areas, the spacial distribution and location of harvest units to provide security and thermal cover, timing and location of road construction and travel restrictions on constructed roads to avoid user conflicts. These mitigation measures often increase the cost and reduce the economic efficiency of management activities.

The Forest currently provides habitat for the endangered bald eagle and gray wolf, the threatened grizzly bear, and potential habitat for the endangered peregrine falcon. Management considerations for these threatened or endangered species may preclude timber harvest, road construction, seismic exploration or other disturbing activities in some small areas surrounding key habitats when they are occupied by these species.

G. Fish Habitat

To protect fishery streams in livestock grazing allotments, the amount of livestock use along riparian areas is limited. These limitations reduce the amount of forage available for domestic livestock. To provide shade along stream and recruitment trees for pool development, timber harvest in riparian areas is limited to uneven-aged management systems. This reduces the potential timber productivity of these areas and increases management costs.

H. Minerals

The Forest contains many existing and potential mineral resources. Development of these resources would drastically affect specific sites through the construction of roads, the removal of vegetation, and the displacement of soil. Such development would increase jobs, affect lifestyle, and impact local community organization and facilities.

I. Fire Suppression

Some lightning-caused fires will be allowed to burn in some areas under a predetermined set of conditions and under close supervision. Managed fire is a part of the current management direction for the Anaconda-Pintler Wilderness. Effective fire suppression is planned on timber producing lands. Soil disturbance and erosion can result from suppression activities.

J. Range Management

Domestic livestock grazing is a major use of Forest land and can have significant effects on other resources. Livestock grazing in riparian areas can have an adverse impact on fish and wildlife habitat by destroying vegetation and causing sedimentation of the stream channel. Livestock grazing on big game winter range reduces the amount of forage available for game species and the use of transitory forage created through timber harvest may cause conflicts with regeneration efforts.

Domestic livestock grazing represents a traditional use of the Forest, and adds greatly to the local economy and to the receipts of the Forest.

K. Timber Management

Timber harvest and associated activities have a major effect on the physical and biological environment. Clearcut and shelterwood are the most commonly used harvest methods on the Forest; however, uneven-aged systems are used in riparian areas, and other areas where appropriate. All silvicultural treatments require on-the-ground evaluations and silvicultural prescriptions prepared by a certified forest silviculturist. The benefits of timber management include: improved age and size class distribution, maintenence of healthy vigorous stands, reduced threat of insects, disease and wildfire, greater productivity of the timber resource and economic returns to the U.S. Treasury. Adverse impacts associated with timber management include: increased soil erosion from harvest units and road construction, short-term loss of big game security cover, loss of visual quality, and the loss of undeveloped recreation opportunities.

L. Road System

Road construction and maintenance has a greater effect on other resources than any other Forest management activity. Road construction displaces large amounts of soil, eliminates wilderness and semiprimitive recreation opportunities, reduces the visual quality, and increases access for hunters, reducing habitat effectiveness for big game.

Roads facilitate exploration and development of minerals, provide access to areas for recreation use and are necessary to accomplish management activities such a timber harvest and domestic livestock use.

M. Other Consequences

The EIS identifies consequences that are direct, indirect, cumulative, or unavoidable; the relationship of short-term use of resources on long-term productivity; and the irreversible and irretrievable commitment of resources.

1. Short-term Use VS Maintenance and Enhancement of Long-term Productivity

Short-term uses include activities such as livestock grazing and timber harvest. Long-term productivity is the capability of the land to provide resources over time. Some alternatives place more emphasis on short-term uses which result in short-term adverse impacts, but under all alternatives the long-term productivity of the land is maintained.

2. Irreversible and Irretrievable Commitment of Resources

Most proposed activities do not cause irreversible commitment of resources since they involve renewable resources. The same activities can be considered irretrievable since there is a reluctance to change direction after an investment has been made. The removal or disturbance of some resources such as minerals or cultural is irretrievable. Degradation of the soil resource is renewable only over a long period of time and is considered irretrievable.

3. Adverse Effects Which Cannot be Avoided

Control of fire, insects, diseases, and noxious weeds is restricted in wilderness and roadless areas. Despite care and maintenance of recreation sites, roads, and trails, water flow is changed and erosion will occur. Timber harvest and access roads will alter big-game and nongame habitat. Mineral exploration and development disturbs soil which can result in erosion and reduce water quality. Localized conflicts will exist between livestock and big game. Timber harvest and road construction activities disturb soil which may increase sedimentation reaching stream channels. This sedimentation may result in decreased fish populations.

4. Mitigation Measures

Mitigation measures were included in the formulation of Forest-wide standards and guidelines, prescriptions, and the minimum management requirements associated with each of the alternatives.

C. **Comparison of Alternatives**

The following table compares important resource and economic outputs scheduled to occur in the first decade.:

	A	B	C	D	F	G	H	Ha	Dept	I	S	Sa	W
Annual Timber Harvest (MMBF)	29.4	33.8	25.8	18.8	36.2	43.6	20.6	23.8	31.6	28.2	17.3	18.1	37.6
Suitable Timber Land (Macres)	535.3	652.5	537.2	313.1	609.3	547.6	378.5	433.7	378.5	347.1	338.3	360.3	615.8
New Road Miles	524	635	533	297	606	533	378	450	436	332	338	359	610
Wilderness Total (Macres)	338	174	1,107	946	620	236	337	337	337	1,416	343	343	489
Roadless (Macres)	1,000	1,045	281	670	656	1,051	1,116	1,061	1,116	174	1,136	1,114	784
Annual Domestic Livestock MAUMs	190	184	182	186	192	185	192	191	199	178	190	189	195
Elk Effective Cover (Macres)	1,114	1,099	1,118	1,140	1,098	1,105	1,128	1,116	1,111	1,136	1,140	1,139	1,097
Catchable Trout (Stream)(Mfish)	334.0	334.8	334.4	337.1	334.0	335.1	337.8	336.6	336.6	337.8	337.9	337.9	334.0
Present Net Value MM$ @ 4%	196	244	170	136	200	249	157	168	172	180	140	143	207
Annual Costs (M dollars/yr)	5246	5850	6566	4737	6113	5862	5079	5368	5573	4705	4965	5030	6163
Market Benefits (M dollars/yr)	7581	7204	5167	5745	8819	9001	4891	5292	6156	6356	4299	4388	9154

CHAPTER I

I. PURPOSE OF AND NEED FOR ACTION (CHAPTER I)

A. Introduction

This Final Environmental Impact Statement (EIS) documents the analysis and discloses the significant environmental effects of a Proposed Action and other alternatives for the future management of land and resources of the Beaverhead National Forest. The Proposed Action is the basis for the Forest Land and Resource Management Plan (Forest Plan) which is described in a separate document. The Forest Plan will guide management of the Forest for the next 10 to 15 years unless conditions or demands significantly change. The analysis in the EIS projects outputs and effects for up to 150 years to indicate the long term implications of continuing with the plan. While long range effects have been estimated, the plan is valid until it is revised, committing the Forest to a course of action no longer than 15 years.

Development of this EIS and Forest Plan followed direction from the Forest and Rangeland Renewable Resources Planning Act (RPA), the National Forest Management Act (NFMA), and the National Environmental Policy Act (NEPA). Further direction was given by the implementing regulations of NFMA (36 CFR 219) and NEPA (40 CFR 1500-1508). The analysis in the EIS and Forest Plan are designed to assure multiple use and provide a sustained yield of goods and services from the Forest to maximize long term net public benefits and address public issues in an environmentally sound manner.

The Proposed Action identified in this EIS maximizes net public benefits; that is, the Proposed Action maximizes the overall value to the Nation of Beaverhead National Forest resources and management activities. This Proposed Action is similar to the one identified in the 1985 Revised Draft Environmental Impact Statement, but has been modified to be responsive to the public comments expressed in response to the 1982 Draft EIS and the 1985 Revised Draft EIS.

Subsequent projects that implement Forest Plan direction will be tiered to this EIS. Environmental analysis will incorporate, by reference, the general discussions in this EIS. Additional analysis will be done for projects not covered by this EIS.

B. National, Regional, and Forest Planning

The analysis and the resultant Final Forest Plan will supersede all previous land and resource management plans prepared by the Forest. They are a direct link and tier to national and regional planning. The national program, required by RPA, sets national direction and output levels for National Forest System lands. These levels are based on availability and capability information provided by Forest Service Regions. Each Region, in a Regional Guide, divides its share of the national production levels among the Forests. The Guide also delineates standards and guidelines for management within the Region. The share for each Forest is based on detailed information furnished by the Forest. Thus, the Forest Plan includes direction provided by RPA, NFMA (including the implementing regulations) and the Regional Guide.

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The EIS results from the first seven of 10 planning actions required by NFMA (36 CFR 219). These seven planning actions are:

1. Identification of issues, concerns and opportunities.
2. Development of planning criteria.
3. Inventory data and information collection.
4. Analysis of the management situation.
5. Formulation of alternatives.
6. Estimated effects of alternatives.
7. Evaluation of alternatives.

Refer to Appendices A and B for a detailed description of the process used in planning actions 1 through 6.

The public and governmental agencies were asked to comment on the Revised Draft EIS and Proposed Forest Plan issued for public review in January 1985. Comments were used to examine the results of the first seven planning steps and to modify the Forest Plan. This Final EIS and Forest Plan were developed following analysis of public comment and reexamination of resource management concerns and opportunities. The Final EIS and Forest Plan will be used by the Regional Forester as the information base for the Record of Decision to complete the planning steps:

8. Selection of the preferred alternative.
9. Plan implementation
10. Monitoring and evaluation.

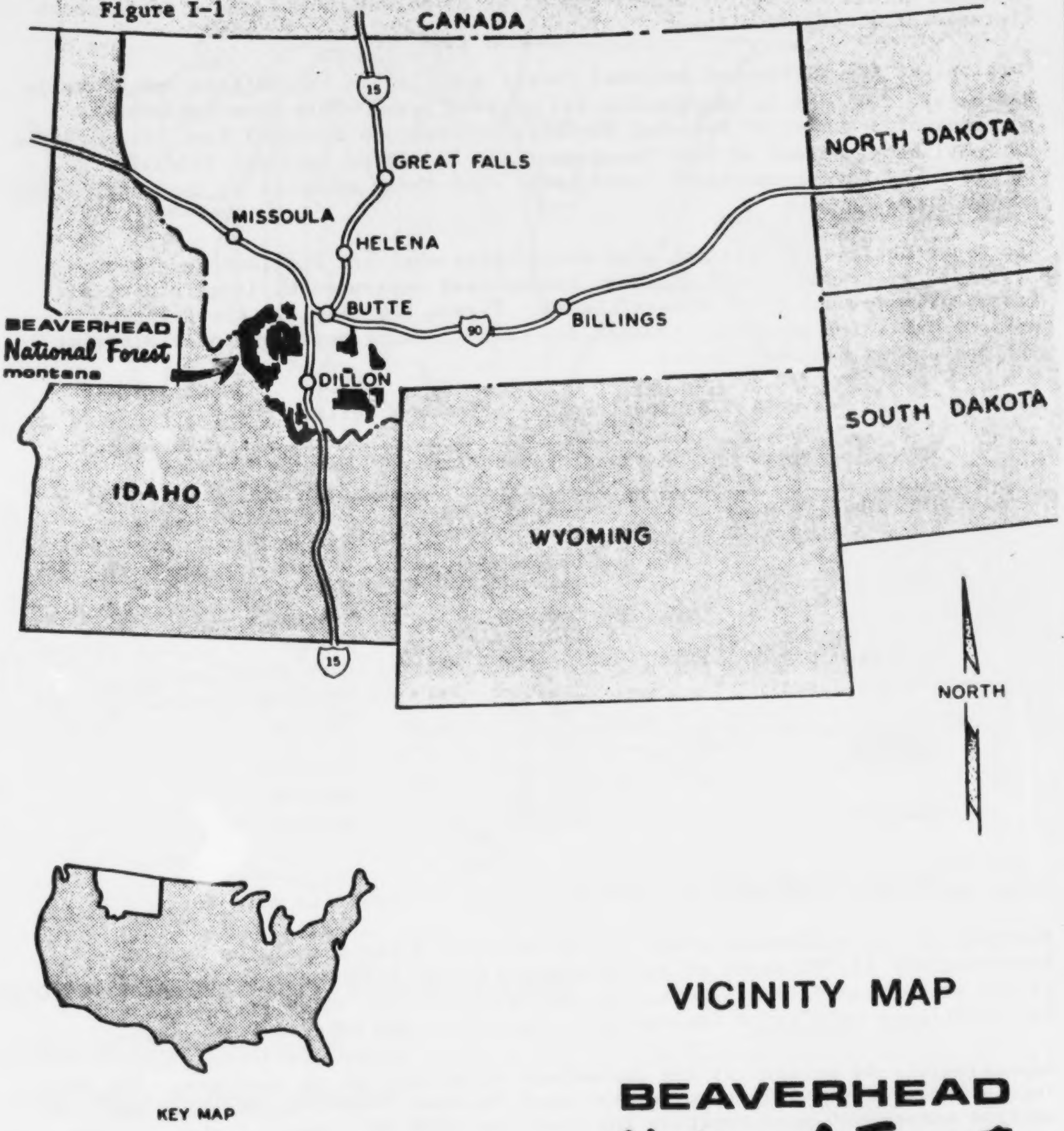
C. Planning Area (Figure I-1)

The Beaverhead National Forest is located in southwestern Montana. The Continental Divide forms the National Forest boundary on the northwest, south, and west. The south and west boundaries are the Montana-Idaho state lines. The crest of the Madison Mountain Range forms the east boundary, and the north boundary crosses through the Tobacco Root Mountain Range and follows a portion of the Continental Divide to the Anaconda Mountain Range. The resulting circle of mountains affects the climate and vegetative cover of the Beaverhead National Forest, which contains features from both the east and west sides of the Continental Divide.

The Beaverhead National Forest lies in portions of five counties--Beaverhead, Deerlodge, Silver Bow, Madison, and Gallatin Counties. The majority of the National Forest (64 percent) lies in Beaverhead County with most of the remainder in Madison County (27 percent). Large portions of the National Forest are visible from Interstate 15, a major north-south travel corridor; U.S. Highway 287, and several State highways.

Several other National Forests border the approximately 2.2 million acres of the Beaverhead National Forest. The Gallatin National Forest to the east, the Deerlodge National Forest to the north, and the Bitterroot National Forest to the west are in the Northern Region of the Forest Service and in Montana, while the Targhee and Salmon National Forests to the south and west are in the Intermountain Region and in Idaho. Over 78,000 acres of private, State, and industrial lands are within the Beaverhead Forest boundary. These acres include

Figure I-1


CANADA
15
GREAT FALLS
MISSOULA
HELENA
BUTTE
90
BILLINGS
NORTH DAKOTA
SOUTH DAKOTA
BEAVERHEAD
National Forest
montana
DILLON
IDAHO
WYOMING
15
NORTH
KEY MAP

VICINITY MAP

BEAVERHEAD
National Forest
montana

Montana State lands, Plum Creek Timber Company acreage, numerous patented mining claims, and homesteads, generally located along creek bottoms. The Beaverhead National Forest has approximately 900 miles of border, and spans a north/south distance of about 110 miles.

Portions of the Beaverhead National Forest occuring in the Madison and Gravelly Ranges are included in the Greater Yellowstone Area. This area includes portions of a number of National Forests, Yellowstone National Park, Grand Teton National Park, Bureau of Land Management and Red Rocks National Wildlife Refuge. The Forest currently coordinates with these agencies in the management of the area.

The Beaverhead can be divided into seven units that are distinct geographical "islands" of predominately National Forest land separated by large blocks of State, private, and other Federal lands. Figure I-2 displays the planning units. Table I-1 provides acreages for each planning unit by Ranger District on the Beaverhead National Forest.

Table I-1 Beaverhead National Forest--Planning Units

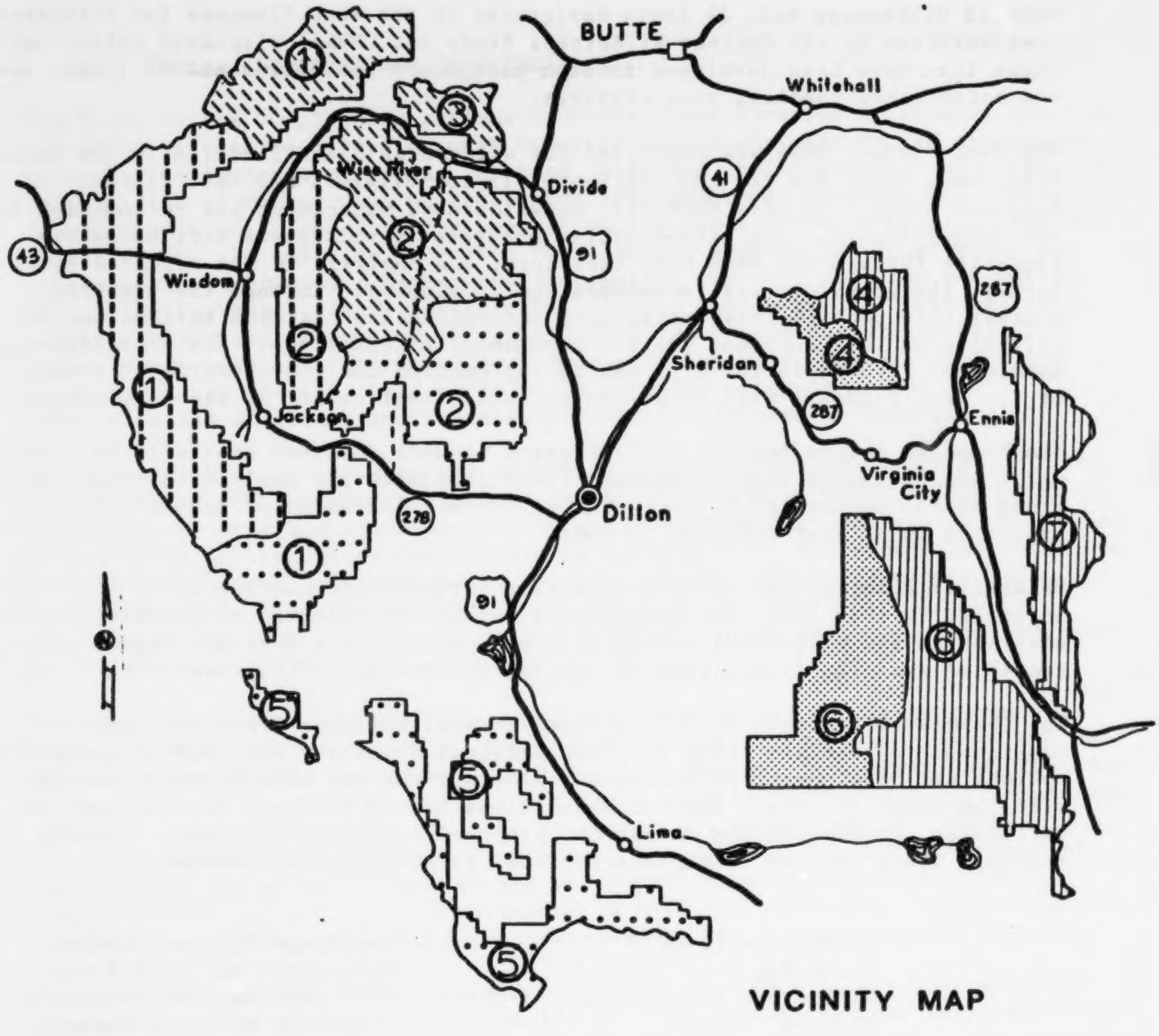
Planning Units	National Forest Acres	Ranger District
West Big Hole	114,000	Wise River
	317,000	Wisdom
	119,000	Dillon
Pioneer	286,000	Wise River
	105,000	Wisdom
	179,000	Dillon
Fleecer	48,000	Wise River
Tobacco Root	56,000	Sheridan
	58,000	Madison
Lima	269,000	Dillon
Gravelly	223,000	Sheridan
	245,000	Madison
Madison	128,000	Madison

These units have been used in planning efforts for analysis purposes.

Portions of two wilderness areas encompass about 8 percent of the Forest. Approximately 72,500 acres of the Anaconda-Pintler Wilderness are administered by the Beaverhead National Forest as are about 101,000 acres of the Taylor-Hilgard portion of the recently classified Lee Metcalf Wilderness.

Approximately 66 percent of the Beaverhead is classified as roadless. The NFMA regulations, as amended, reguire that each National Forest reinventory and analyze management opportunities for roadless lands as a part of the planning process. The roadless area inventory completed in September 1983 identified about 1,246,000 acres to be considered for wilderness classification. This inventoried roadless acreage includes all lands that were inventoried as roadless in the 1977 RARE II inventory with the exception of: 1) lands that have since been classified as wilderness or released from consideration by the Lee

Figure I-2


BUTTE
Whitehall
Divide
Wise River
Wisdom
Jackson
Sheridan
Ennis
Virginia City
Dillon
Lima
43
41
91
287
278
1
2
3
4
5
6
7
VICINITY MAP

RANGER DISTRICT LOCATIONS

- Dillon Ranger District ⁘
- Wise River Ranger District ▨
- Wisdom Ranger District ┆
- Sheridan Ranger District ░
- Madison Ranger District ▥

PLANNING UNITS

1. WEST BIG HOLE
2. PIONEER
3. FLEECER
4. TOBACCO ROOT
5. LIMA
6. GRAVELLY
7. MADISON

FOREST PLANNING AREA

Metcalf Wilderness Act, 2) lands designated in the West Pioneers for wilderness consideration by the Montana Wilderness Study Act (MWSA) discussed below, and 3) lands that have been developed through management activities and no longer meet the established roadless area criteria.

The West Pioneer MWSA was evaluated for wilderness classification in the Montana Wilderness Study EIS for the Mt. Henry, Taylor-Hilgard, and West Pioneer Roadless Areas. In this MWSA EIS, nonwilderness management was recommended for the West Pioneers. The site-specific analysis of wilderness attributes was conducted through the MWSA EIS; therefore, the analysis is not repeated here. Rather, the nonwilderness recommendation is adopted. Through the planning process this nonwilderness management recommendation has been refined and is reflected in this document for all management alternatives. The nonwilderness management recommendation will not be implemented and the wilderness character of the West Pioneers will be protected until final action is taken by Congress.

The Proposed Action for the Mt. Jefferson (1-962) roadless area will be deferred until the Bureau of Land Management (BLM) completes its analysis of roadless areas in the Centennial Valley. The wilderness character of the area will be protected until that decision is made.

Wilderness alternatives for the remaining inventoried roadless areas are addressed in this EIS. Recommendations within the selected alternative for any addition to the wilderness system will be included in a separate report and record of decision transmitted by the administration to Congress.

The Beaverhead National Forest includes several roadless areas that are contiguous to roadless areas on other National Forests. Analysis of management options and development of management alternatives has been closely coordinated with the other Forests. The recommendations of the Proposed Action, in particular, considered the Management proposed on contiguous lands. These roadless areas and the contiguous National Forests are as follows:

Storm Lake (1-427)	Deerlodge National Forest
North Big Hole (1-001)	Bitterroot National Forest
Middle Mt. Tobacco Root (1-013)	Deerlodge National Forest
Fleecer (1-011)	Deerlodge National Forest
Italian Peak (1-945)	Targhee National Forest Salmon National Forest
West Big Hole (1-943)	Salmon National Forest
Garfield Mt. (1-961)	Targhee National Forest
Anderson Mt. (1-942)	Salmon National Forest
Goat Mt. (1-944)	Salmon National Forest

D. Issues, Concerns and Opportunities

The first of the 10 planning actions involves identification of issues, concerns and opportunities to determine what benefits people want the Forest management to emphasize in terms of goods, services, uses and environmental conditions. An initial list of Forest-wide public issues and management concerns was developed from comments solicited from the general public, past planning records, and the Forest staff. In addition, requests for comments were mailed to adjacent and intermingled landowners. Background information was sent to Idaho and Montana state clearinghouses, local public officials and Indian tribes. Several public meetings were held throughout the area influenced by the Beaverhead National Forest management activities and decisions. Workshops on Montana Wilderness Study Act areas had been held in 1979. A detailed synopsis of the identification of issues and concerns process is included in Appendix A.

Additional public involvement was initiated in September 1983, to aid in resolution of the roadless management question. Prior to this, Forest planning efforts under NFMA had examined a broad range of uses for roadless areas but had not included an evaluation for wilderness designation. The Forest had relied on earlier evaluations and recommendations made in the RARE II (Roadless Area Review and Evaluation) Final EIS. As a result of the Ninth Circuit Court decision on the RARE II EIS, the Forest included an evaluation of roadless areas for wilderness in the Forest planning process.

Numerous public comments were generated from the initial public involvement process. With further analysis, these comments were grouped and summarized as the six major issues, management concerns, and resource management opportunities to be addressed in the Forest Plan. Criteria used to determine major issues and concerns included: ranking of issue at workshops, history of the issue, perceived intensity of conflict surrounding the current issue, opportunity of the National Forest to respond to the issue, and expected duration of the issue. Following the public involvement in 1983, an additional issue was added, resulting in a total of seven to be addressed by the Forest planning process.

Following the release of the Revised Draft Environmental Impact Statement and Supplement to the Forest Plan in January of 1985, the Beaverhead again solicited the pubic for comments. A full description of the comments received is included in Chapter VI in this EIS. The public issues, management concerns and resource management opportunities (ICOs) addressed in the Forest Plan and a brief summary of the comment received pertaining to each is displayed below.

1. **(ICO)** - How much of the forage produced on the Beaverhead National Forest should be used by domestic livestock? What constraints should be applied to the domestic use of forage?

   (Comment) - Comments were received concerning conflicts between wildlife and domestic livestock use of wildlife winter ranges, the impact of grazing on riparian areas, and the importance of the livestock industry to the local economy. Commenters generally supported establishment of Allotment Management Plans, implementation of range improvements, and control of noxious weeds.

2. **(ICO)** - What areas should be managed for a continuous supply of timber products? When and where should timber harvests be scheduled?

   (Comment) - Many of the comments expressed concern over the impact of timber harvest on other resources such as fish and wildlife habitat, roadless recreation opportunities and water quality. Others were concerned the level of harvest was too low to maintain local forest related industries. Many comments were received which addressed proposed timber harvest in specific areas.

   The comments on the Revised Draft EIS regarding timber sale economics, in combination with the focus on that topic by Congress and National interest groups, has led to identification of "below cost" timber management as a management concern. Below cost timber management describes a situation where timber receipts do not exceed the costs to the Government of preparing the timber sale program. This is a concern on the Forest because generally, initial entries into areas for timber management result in timber sales where receipts do not exceed cost.

   Major factors contributing to "below cost" situations are high roading costs associated with first entry sales, relatively low timber volumes per acre and low selling values due to small product diameter. Over the long term, a positive cash flow can usually be expected. Future entries into sale areas require less road to access available timber stands and roading costs are significantly less.

3. **(ICO)** - To what degree should the various recreation opportunities be made available for public use?

   (Comment) - Comments indicated that the public requires a full range of recreation opportunities; however, a majority of the comment received favored protection of roadless recreation opportunities.

4. **(ICO)** - What actions are necessary to provide wildlife habitat to meet elk and fish objectives established in cooperation with Montana Department of Fish, Wildlife, and Parks?

   (Comment) - Comments indicated concerns that resource development, such as timber harvest and road construction, will have an adverse impact on wildlife habitat. Others felt that restrictions placed on resource development to protect wildlife habitat were unnecessarily restrictive. Wildlife management agencies and some members of the public felt the trumpeter swan, cutthroat trout and arctic grayling were of special concern, and deserved greater emphasis in the mangement of the Forest.

5. **(ICO)** - What additional road rights-of-way are needed to provide reasonable public access to National Forest System lands buffered by private ownership?

(Comment) - Comments generally supported increasing public access to National Forest lands but concerns were expressed over condemnation of private land to obtain rights-of-way, the impacts associated with public traffic across private lands and loss of wildlife habitat security in some areas.

6. **(ICO)** - What effects will management of surface resources have on access for exploration and development of mineral and energy resources? How should effects that make access difficult or costly be considered in proposals for land use?

   (Comment) - Commenters were concerned that exploration and development of mineral resources would impact wildlife, fisheries, or the roadless nature of undeveloped areas. Other were concerned that wilderness designation of areas would preclude development of valuable mineral resources.

7. **(ICO)** - What inventoried roadless areas should be recommended for wilderness? Are there portions of inventoried areas that should be excluded from recommendation because of conflicting uses or new information? Of the roadless areas not recommended for wilderness, how should these areas be managed?

   (Comment) - Comment was received both for and against further wilderness designation on the Forest. Comments generally supported or recommended non-wilderness for specific areas. Areas receiving the greatest number of comments were the West Big Hole, Italian Peaks, Tobacco Roots and West Pioneers.

Major areas of comment and change between the Revised Draft and Final EIS

Following the publication of the Revised Draft EIS in January 1985, the Forest solicited public comment. Open houses were held in various locations within the planning area, public meetings were held with interested groups, articles appeared in local and regional newspapers and Forest staff made personal contact with interested parties and groups. As a result of these efforts, the Forest received over 770 letters (during the public comment period) addressing a variety of subjects covered in the draft EIS and proposed supplement to the Forest Plan. In addition, the Forest received about 50 written comments after the close of the public comment period. (These late responses were not included in the comment analysis; however, they were considered as the Forest Plan was finalized.) A general analysis of public comment received in 1982 and 1985 is located in Chapter VI. All public comment and Forest Service response is located in unbound appendix D, available for public review at the Beaverhead National Forest Supervisor's Office in Dillon, Mt. and the Northern Region Office in Missoula, Mt.

The comments ranged from specific issues to broad concerns about the Forest Plan and planning process. In addition, national concerns caused some changes in Forest Plan format and content. These areas of comment and change are summarized below.

Recreation - Many of the comments received on the preferred alternative supported increased protection of existing unroaded areas. Respondents felt that more area should be included in wilderness proposals or protected from the impacts of road construction and resource development.

In response, the Forest developed two additional alternatives (S and Sa) which increase the wilderness proposal in the Italian Peaks, increase the size of the recreation management area within and adjacent to the West Pioneer Montana Wilderness Study area and propose additional recreation management areas for the Tobacco Root Mountains, the Snowcrest Mountains, the Minneopa Lake area and the Garfield Mountain area adjacent to the Italian Peaks. These area designations preclude new road construction for surface management purposes and are unsuitable for timber management.

Economics - Comments concerning economics were common. Some respondents were concerned that the proposed timber program on the Forest would not result in a positive cash flow (where receipts to the U.S. Government exceed costs of management) due to low timber productivity and high harvest and road construction costs. Some commenters argued that timber management should not occur on the Forest for that reason.

Internal and external concerns were generated by the estimated timber values, costs and value projections used in the FORPLAN model. Due to the recent downturn in the timber market, revieweres argued that these values and projections, developed prior to 1980, may not reflect current or future trends.

In addition, some reviewers argued that the tradeoffs between priced resources such as timber and nonpriced resource values such as elk habitat security or roadlessness were not adequately discussed.

In response to these issues, the economic displays and alternative comparisons presented in Chapter II have been greatly expanded. A sensitivity analysis of the Proposed Action and Maximum PNV Benchmark using different timber values and timber value projections was completed. The major findings of that analysis are presented in Appendix B.

A discussion has been added to Chapter III displaying timber sale receipts and timber related costs for the years 1982 through 1984. These figures are presented to show the relationship of costs to returns associated with the current timber program.

Visual Quality Objectives - Visual Quality Objectives (VQOs) were originally assigned to FORPLAN management prescriptions. The amount of acreage assigned to each VQO for different alternatives was displayed in the draft documents. National direction for assigning VQOs does not allow alternative assignments, but rather sets VQOs based on visual sensitivity and the characteristics of the landscape. The amount of area visually impacted by each alternative will vary by alternative due to differing amounts of resource development but VQOs remain consistent across all alternatives.

In response to this direction, the displays of acres assigned to VQOs for each alternative have been deleted or replaced with appropriate figures of impacting resource development. An appendix has been added to the Forest Plan which describes areas of the Forest which are deemed visually sensitive.

Wildlife - A number of wildlife issues generated changes between the Revised Draft and Final EIS. Commenters recognized that the trumpeter swan is known to nest on the Forest at Elk Lake and in some smaller lakes adjacent to the Red Rocks National Wildlife Refuge. This species is of special concern due to its relatively low populations and low reproduction rate. Commenters felt that the swan should receive added attention in the management of the Forest.

In response to these concerns, the swan was added to the list of wildlife indicator species to be periodically monitored.

Commenters, both public and Forest Service, felt that restrictions placed on timber harvest in response to wildlife standards in alternative H and Ha did not adequately reflect the amount of effect. These alternatives contain standards that require retention of at least 70 percent elk effective cover within a given area. Also, hiding cover must be regained in harvested units before harvest of adjacent units can occur. In most areas, regaining hiding cover takes between 20 and 30 years. These restrictions limit the amount of harvest which is allowed in an area at any given time, and extends the reentry period for future harvests. Commenters felt that these restrictions limit the rapidity with which the existing mature sawtimber can be removed from an area to approximately 100 years.

In response to this concern, further analysis of the effects of wildlife standards on timber harvest was completed and the contraints in FORPLAN strengthened. The two additional alternatives (S and Sa) contain constraints applied to the FORPLAN model which limit the amount of regeneration harvest of mature sawtimber to 10 percent of the existing acres in each decade. This constraint was applied to the first five decades, thus allowing only 50 percent of these acres to be harvested in the first fifty years. The constraint was applied to lodgepole and mixed conifer types separately so that harvest was not concentrated in the higher value mixed conifer. The constraint also responds to previous issues relating to the retention of old growth habitats.

Commenters felt that the discussion of nongame wildlife species occurring on the Forest was inadequate.

The Forest feels that nongame species are very important but recognize that the species are numerous and diverse. Individual species depend on specific habitats. Managing for these species as a general group requires maintaining a wide variety of vegetative communities and successional stages across the Forest. Sections of the Final EIS are expanded to recognize the importance of these animals and their relationship to overall vegetative diversity.

Fisheries - Figures relating to potential fish populations in the Revised Draft EIS included both lake and stream fisheries. The Montana Department of Fish, Wildlife and Parks pointed out that since management activities are not considered to have significant effects on potential lake fish populations, the total figures masked the effect of management activities on potential stream populations.

In response, figures were changed to display only potential stream fish populations. Figures displaying potential recruitment to downstream fisheries are based entirely on stream effects, and remain unchanged.

The Department of Fish, Wildlife and Parks and other commenters felt that the arctic grayling and cutthroat trout were important species to be considered in the managment of the Forest. These species require excellent water quality to survive and reproduce, thus are useful as indicators of the general health of the aquatic ecosystem.

In response, arctic grayling and cutthroat trout were added to the list of wildlife indicator species to be monitored through implementation of the Proposed Action.

Wilderness/Roadless - Between the Revised Draft and Final EIS, the acreage figures for existing wilderness were refined. Final figures relating to land exchanges consumated in the Lee Metcalf Wilderness increase the acreage from 91,000 to 101,000 acres. These changes also increase the Forest acreage from 2,140,000 to 2,147,000. Small refinements in the modeling of the Anaconda/Pintler Wilderness boundary has slightly changed those figures. Small refinements were also made in individual roadless area acreages although the total roadless figures remain unchanged. All changes are adjustments to data and do not affect actual wilderness boundary locations.

Vegetative Practices - In response to national and regional level concerns, the discusson of even-aged and uneven-aged silvicultural systems has been expanded. Each system can be appropriate for use where management objectives are met, where physical characterisics of the land allow, and where vegetative needs are provided for. These general criteria have been further explained in Chapter IV.

Research Natural Areas - Several new areas have been included as candidate Research Natural Areas. These new areas generally occur outside areas planned for resource development. The additional areas are shown in Chapter III.

Timber Utilization Standards - In response to the concerns of timber industry, the Proposed Action and the Maximum PNV Benchmark were analyzed using both current timber utilization standards and those proposed in the Northern Region Guide. Timber volume outputs and the effect on Present Net Value are displayed in Chapter II.

Planning Period - Commenters displayed some confusion over the period of which the Proposed Action is to be implemented.

The Proposed Action is to be implemented for a 10 to 15 year period. After that time, planning issues will be reevaluated and the Proposed Action will be revised. Revisions or amendments to the Forest Plan may occur sooner if changes in the demand for resources, in issues associated with management, or in the Forest itself occur. Data displayed for periods longer than the 10 to 15 year period are projections based on continued implementation of the Proposed Action.

Proposed Action - Alternatives H and Ha were presented as the Proposed Action in the Revised Draft EIS. Two new alternatives, S and Sa were developed directly from from alternatives H and Ha, incorporating changes resulting from public comment and internal concerns discussed above. Alternatives S and Sa replace H and Ha as the Proposed Action in the Final EIS. Alternatives H and Ha have been retained to compare changes in output. As in Alternatives H and Ha, the Proposed Action has been analyzed with and without the Montana Wilderness Study Act area available for management of a variety of resources. In Alternative S, the area is held in a custodial management designation. If the Congress of the U.S. acts to release the area from wilderness consideration, as the Forest Service has recommended, Alternative Sa would be implemented. Alternative Sa proposes non-wilderness management for the area; however, a large portion would be retained in a recreation management area. If Congress acts to designate the area as wilderness, the resource production opportunities of Alternative S would be retained.

Editorial Changes - Editorial changes have occured in all sections of the document. These changes are designed to correct insignificant errors or to clarifiy previous wording. The original content has been retained.

E. Reader's Guide

The remainder of the DEIS is organized as follows:

Chapter II describes alternatives by showing the resource outputs, costs, benefits, and major effects of meeting the objectives of each alternative. The environmental, economic, and social effects of alternatives are briefly compared.

Chapter III provides a brief discussion of the existing condition of physical, biological, social, and economic components of the environment that may be affected by management of the National Forest.

Chapter IV identifies the environmental consequences which could result from Forest management activities scheduled in each alternative.

Chapter V provides a list of individuals directly involved in the development of the documnents through the process.

Chapter VI discusses the efforts to involve and consult with a variety of publics during formulation of the Forest Plan and Final Environmental Impact Statement (FEIS). It also lists and responds to comments recieved from other agencies, local governments and elected officials during the public comment period for the proposed Forest Plan and Revised Draft EIS.

Appendices provide detailed subject information: issue identification in Appendix A, description of the analysis process in Appendix B, site specific roadless area data in Appendix C, and public comment in Appendix D.

The Glossary contains definitions of technical terms and abbreviations.

Planning records, which document the planning process, are available for review at the Supervisor's Office, Beaverhead National Forest, 610 North Montana Street, Dillon, Montana.

CHAPTER II

II. **ALTERNATIVES** (Chapter II)

A. Introduction

This chapter presents the development, description, and comparison of alternative ways of managing the Forest's land and resources. The development process involves an analysis of the management situation which includes a determination of minimum and maximum resource and value potentials. This step identifies the capabilities of the Forest (see section B).

The alternative descriptions identify the objectives of each alternative, where the alternative fits in the range of alternatives considered, and how it responds to issues. The resource, economic, social, and proposed land uses are also shown (see section C). Section D compares alternatives by resource outputs, social and economic effects, response to major issues, and nonpriced benefits.

Graphic displays are provided which visually display the location of proposed land uses for each alternative.

B. Alternative Development

1. Overview

Forest planning began by identifying public issues and management concerns. Refer to Appendix A for a description of this process. Once the issues were identified, information was needed to determine the Forest's capability to respond to each issue. This step was the analysis of the management situation and resource data; economics information and environmental/legal constraints were examined. Benchmarks were developed and analyzed to measure resource and economic interrelationships. Information on resource production potential guided the development of alternatives and determined the range to be considered.

Alternatives were developed to respond to issues, present net value (PNV), and net public benefits (NPB). A single numeric NPB value was not calculated since monetary values associated with some resources such as timber cannot be added to the qualitative value of nonpriced benefits such as visual quality. An understanding of the various types of values and interrelationships associated with Forest outputs aids decision-makers in the selection of an alternative that maximizes net public benefits. See Appendix B, section IV for a further discussion of NPB and PNV.

The alternative development process used here is outlined in 36 CFR 219.12. These regulations include the following goals for alternative formulation:

-Provide basis for identifying the alternative that maximizes net public benefits.

-Be distributed between the minimum and maximum resource potential and reflect a range of environmental resource uses and expenditure levels.

-Facilitate analysis of opportunity costs and tradeoffs.

-Facilitate evaluation of effects on present net value, benefits, and costs.

-Provide different ways to respond to major public issues.

Summary of changes since the Revised Draft EIS

Two additional alternatives were developed in response to public comment,internal analysis requirements, additional management concerns, and refinement of existing data. These alternatives, designated Alternatives S and Sa, were developed from Alternatives H and Ha, incorporating those categories of changes described above. Alternatives H and Ha have been retained to compare the magnitude of output differences in the transition from H/Ha to S/Sa. Supporting narratives, developmental criteria, outputs and comparisons for these alternatives have been added throughout this chapter in the appropriate sections.

Corrections to text, tables and figures have been incorporated. These corrections were listed in the errata sheet included with the Revised Draft EIS.

In response to public comment and internal concerns the analysis of economic costs and benefits and net public benefits of and between alternatives has been expanded. The results of these analyses are discussed in detail.

Additional acres have been added to the Lee Metcalf Wilderness as a result of land ownership adjustments consummated through the Lee Metcalf Wilderness Bill. These adjustments are included in discussions and tabular data. Small changes have been made in the acreage displayed for the Anaconda/Pintler wilderness. These changes result from refinement of data and do not affect actual boundary locations.

All figures displaying fishery potential have been modified to include only stream fisheries. The Revised Draft EIS displayed total Forest fisheries including lake fisheries which are not expected to be affected by management actions. A discussion of existing lake fisheries is retained in Chapter III.

Acres assigned to Visual Quality Objectives has been deleted from the tabular data. Refinement of the assignment process has invalidated data displayed in the Revised Draft EIS. Visual Quality Objectives will be determined during project level analysis using methods and visual sensitivity levels described in the Forest Plan.

2. Analysis of the Management Situation

The analysis of the management situation determined resource supply potentials by establishing minimum and maximum production levels called benchmarks. A level was also established from which the costs and effects of applying regulation and policy constraints were measured. Production capabilities were determined for single resources and for a set of multiple resource outputs that maximized present net value. This analysis established the benchmark levels required by NFMA regulation 219.12e.

a. Benchmarks

Eight (8) benchmarks were developed to define resource supply potentials and economic relationships associated with management of the Forest. Production capabilities were determined for single resources and for a set of multiple resource outputs that maximize present net value (NFMA regulation 219.12e). A minimum level of management was established from which the costs and effects of applying regulation and policy constraints were measured. Current direction was established from the 1978 Beaverhead National Forest Land and Resources Management Plan. The computer model FORPLAN was used to help determine the resource supply potentials. (See Appendix B for a discussion of FORPLAN).

The benchmark levels and analyses are summarized in this chapter. Appendix B, Section VI, provides a detailed discussion of the benchmarks.

1) Constraints

Regulation and policy constraints (that is, limits applied to achieve, protect, mitigate and/or maintain a desired or required multiple-use situation) are applied to benchmarks and have, in most cases, the effect of reducing the maximum resource supply potential. NFMA regulation 219.27 specifies that certain minimum management requirements be included in the planning process. The methods to meet these minimum management requirements include developing standards and guidelines and appropriate management practices for management prescriptions; assignment of management prescriptions and intensities to analysis areas in FORPLAN; and applying specific constraints in FORPLAN. A complete description of the minimum management requirements can be found in Appendix B, Section VI. Constraints commonly applied to the benchmark levels except for the minimum level benchmark are:

> All benchmarks comply with minimum management requirements. Basic soil and water productivity are protected through a nondeclining timber harvest flow constraint or an acreage constraint which limits the amount of harvest occurring in planning units.
>
> Timber management constraints were used to preclude harvest from existing wildernesses.
>
> An Ending Timber Inventory constraint was used so that timber inventory in 150 years will equal or exceed the volume that would occur on a regulated Forest.

Other Constraints were:

No livestock grazing is permitted on elk winter ranges in the maximum wildlife benchmark.

The minimum level benchmark is constrained to produce no management induced outputs such as timber or grazing in order to determine the basic cost of Federal ownership.

The Current Direction benchmark is constrained to assign the Forest acreage management prescriptions that replicate the management direction of the 1978 Beaverhead National Forest Land Management Plan.

2) **Benchmark Descriptions**

Resource management opportunities were determined through benchmark analyses utilizing the FORPLAN computer model or through analyses external to FORPLAN that utilized the best available inventory data and professional judgement. The following benchmarks were developed and analyzed in FORPLAN. A more detailed discussion is found in Apendix B, section VI C.

a) **Minimum Level Benchmark** (Run I.D.--102MLA)

This benchmark defines the minimum costs of public land ownership and the resource outputs which are incidental to Forest Service management. The objective is to maximize PNV with only three management prescriptions available for selection--custodial management, wilderness study, and wilderness management. In the latter, wilderness management occurs at reduced service levels. Existing timber sales and grazing permits are phased out so that costs and outputs for these activities are zero at the end of decade one.

b) **Maximum Wilderness Benchmark** (Run I.D.--102MWA)

This benchmark explores the opportunity to maximize classified wilderness on the Forest. All inventoried roadless areas are assigned a wilderness prescription. National Forest lands outside the inventoried roadless areas are assigned a variety of prescriptions, with that assignment guided by the objective of maximizing PNV. This benchmark defines the maximum wilderness designation and management costs and benefits. The opportunity costs of maximizing wilderness designation and management are established by comparing this benchmark with the maximum PNV benchmark. This benchmark is carried forward in the planning process as an alternative (Alternative I).

c) **Maximum Timber Benchmark** (Run I.D.--102MTD)

This benchmark explores the costs and benefits of maximizing timber production on the Forest. Constraints designed to ensure a nondeclining flow of timber and an inventory of timber at the end of the planning period ensure the proper distribution of harvest over time and space so the soil and water resources are protected. The economic tradeoffs of maximizing timber can be assessed by comparing this benchmark with the maximum PNV benchmark. This benchmark is not carried forward as an alternative because investment requirements are quite high and public issues regarding other resources besides timber are not adequately addressed.

d) **Maximum Wildlife Benchmark** (Run I.D.--102WRA)

This benchmark focuses on the elk habitat production potential for the Forest. The benchmark maximizes forage production. Timber harvest is permitted on all potentially suitable lands outside classified and recommended wildernesses. The ending inventory and nondeclining flow constraints for timber are incorporated in this benchmark. No livestock grazing is permitted on elk winter ranges to provide the maximum amount of forage to the elk. This benchmark assumes elk on winter ranges utilize 65 percent of plant production, with 35 percent retained to ensure continuing plant vigor. To ensure forage production, constraints are used to require at least 175 MMBF of timber harvest per decade. This benchmark is not carried forward as an alternative because public concerns regarding other resources are not adequately addressed.

e) **Maximum Livestock Range Benchmark** (Run I.D.--102RGB)

This benchmark displays the maximum potential of the Forest to produce forage for domestic livestock. Forage production is maximized through investments in range improvements (sagebrush burning for example) and by allowing timber harvest to fluctuate between decades so that high levels of grass production can occur on transitory rangeland. A constraint is used to ensure that an inventory of timber is maintained at the end of the planning horizon. Harvest constraints are used to control the amount of timber harvested in each planning unit to ensure that minimum management requirements for soil and water are met. As the amount of transitory range varies, the amount of livestock capacity varies through the planning horizon. This benchmark is not carried forward as an alternative because the fluctuating timber program and range programs would cause economic instability and other resource values are not adequately considered.

f) **Maximum Present Net Value (PNV) Benchmark**
(Run I.D.--102NWA)

This benchmark explores the opportunity to maximize the net monetary value (cost efficiency) of priced market (timber, range, developed recreation, and mineral leases) and nonmarket resources (dispersed recreation, wildlife, visual quality, wilderness, soil and water). It defines the "mix of resource uses, combined with a schedule of outputs that have an established market price or are assigned a monetary value" (CFR 219.12 (e) and Chief's letter date May 31, 1983). This benchmark provides the basis for evaluating the economic tradeoffs of the minimum management requirements (MMR's) and nondeclining flow. It also provides a basis of comparison for the other benchmarks which strive to maximize resources such as wilderness, elk habitat production potential, livestock forage, and timber. It provides a basis for evaluating the costs and benefits of continuing current management direction. Finally, the maximum PNV benchmark provides the basis for determining the opportunity cost of implementing other alternatives, each of which is constrained to meet specific resource management objectives.

The maximum PNV benchmark includes the ending inventory and nondeclining flow constraints on timber harvest. The West Pioneer Wilderness Study Area has been assigned custodial management. All potentially suitable lands are available for timber harvest. This alternative has been modified and carried forward as an alternative (Alternative B).

g) **Maximum PNV Benchmark (Market values only)** (Run I.D.--102NWZ)

This benchmark explores the opportunity to maximize the net market values of the Beaverhead NF. It defines the "mix of resource uses, combined with a schedule of outputs and costs, which will maximize the present net value of those major outputs that have an established market price" (CFR 219.12e). It is modeled like the maximum PNV benchmark (that included both market and assigned values). Only timber, developed recreation, and range values contribute to the calculations of PNV.

h) **Current Level Benchmark** (Run I.D.--102CDB)

This benchmark defines "the current level of goods and services provided by the unit and the most likely amount of goods and services expected to be provided in the future if current management direction continues" (36 CFR 219.12e). This benchmark is modeled by assigning prescriptions to analysis areas that most closely represent current management direction as it was specified in the existing 1978 Beaverhead Land Management Plan and through the RARE II Final Environmental Impact Statement. The opportunity cost of continuing current management with no budget constraints to reflect existing and historic budgets can be determined by comparing this benchmark with the maximum PNV benchmark. This benchmark also provides the opportunity to examine the tradeoffs associated with the budget constraints of Alternative A, the "no action" or Current Program alternative.

Sixteen other variations of the above benchmarks were developed to examine the costs and benefits of no additional wilderness, timber harvest at culmination of mean annual increment (CMAI), nondeclining timber harvest flow, transitory range forage potential, protection of soil and water, and the timber ending inventory constraint. These variations are called increments and are described in detail in Appendix B, Section VI.

b. **Benchmark Analysis**

Analysis of the benchmarks established upper and lower potential production levels for selected resources. Additional analysis was done to estimate projected use levels. The following resources were analyzed.

1) Developed Recreation

Developed recreation sites on the Forest have an optimum potential of 494,000 recreation visitor day's (RVD's) of use per year. Actual use in fiscal year (FY)1980 was 179,000 RVD's. Forest-wide developed recreation site capacity exceeds projected demand through the fifth decade.

2) Dispersed Recreation

Dispersed recreation use, exclusive of wilderness recreation use, in FY 1980 was 304,800 RVD's. The capacity of the Forest, including primitive and semiprimitive motorized and nonmotorized areas, is estimated to be approximately 1,780,000 RVD's. This level of capacity is more than enough to meet the projected forest-wide levels of demand for all types of dispersed recreation through the fifth decade. Capacity of an area to accommodate recreationists should not be equated with quality of the recreational experience. Quality of experience is associated with the setting, investment in and maintenance of recreational improvements, and so on.

3) Wilderness

The Beaverhead National Forest currently has approximately 173,500 acres of classified wilderness in two wilderness areas--the Anaconda-Pintler Wilderness and the Taylor-Hilgard portion of the Lee Metcalf Wilderness. These areas have an optimum capacity of at least 150,000 RVD's of primitive recreation. Current use of the areas is estimated to be about 21,000 RVD's per year for the Anaconda-Pintler, and unknown for the Lee Metcalf since classification has occurred only recently. The capacity of these two areas is sufficient to accommodate expected levels of use through at least the fifth decade.

The Beaverhead has approximately 1,246,000 acres of inventoried roadless areas in addition to the existing wilderness areas. In the Maximum Wilderness Benchmark, all inventoried roadless areas are assigned wilderness management prescriptions, resulting in additional RVD's of wilderness capacity far in excess of projected demand. However, additional classification provides a greater diversity of settings and more types of experiences. Classification of substantial additional wilderness will have an impact on the capacity of the Forest to provide nonwilderness dispersed recreation opportunities, particularly in the semiprimitive motorized category.

4) Domestic Livestock Forage

The Forest has the capacity to meet current livestock forage demands and has the potential to increase forage production through investments in range improvements, extensive and intensive management of permanent rangeland, and through creation of transitory forage. Transitory forage is maximized with departure from nondeclining even flow timber scheduling and large harvest units. The amount of increase in forage production depends on management objectives for other resources, such as management of elk habitat, and the costs of producing animal unit months (AUM's). Current permitted domestic livestock use is 190,000 AUM's. The maximum livestock potential is approximately 231,000 AUM's in decade 1, with a peak of 264,800 in decade 2 and low points in decades 6 thru 8 of 205,900 AUM's per year and in decade 9 of 204,900 AUM's per year. The average forage production potential of the Forest over the planning horizon is 225,000 AUM's per year. The fluctuations in forage production result from the production of transitory forage following timber harvest.

Forage produced above levels produced in the maximum PNV benchmark are accomplished through inefficient investments. Forage produced in the Maximum Range Benchmark also results from the nondeclining flow constraint. The AUM's produced in decade 1 in the maximum PNV benchmark average 180,000 AUM's per year. The peak production level is 203,600 in decade 4. The costs of producing the forage modeled by the Maximum Range Benchmark are at least 20 percent higher than the costs of producing the forage modeled by the Maximum PNV Benchmark.

The current situation stocking level of 190,000 AUM's per year is dependent upon approximately 12,000 acres transitory forage. Production levels above the 190,000 AUM's per year will require the use of even more transitory forage utilization.

Demand for permitted livestock grazing on Forest lands is expected to increase to the extent to which permitted use is made available. Lands administered by the Forest complement private ranching operations tend to "round out" the forage availability to support year-round management.

The Alternatives are evaluated against their ability to meet RPA objectives as shown in the Region One Guide. The objectives assigned for annual livestock grazing use in thousands of AUM's per year is shown in Table II-1.

Table II-1 (RPA Domestic Livestock Forage Objectives in thousands of AUMs)

1984	1985	1986 1990	1991 2000	2001 2010	2011 2020	2021 2030
193.9	194.5	190.0	203.0	228.0	245.0	262.0

5) Elk Winter Range

The benchmark analysis indicates that winter range is the limiting factor in managing for elk. Summer range is more than adequate to sustain the number of elk that can be supported on winter range. The maximum wildlife habitat potential benchmark established a supply potential for the Beaverhead Forest that provides a winter range capacity of 7700 elk if all the permitted livestock were removed from elk winter range. The Montana Department of Fish, Wildlife and Parks has estimated that approximately 7500 elk are currently wintering on other ownerships adjacent to the Beaverhead Forest. This results in a potential winter range capacity of 15,200 elk on the overall winter range.

The number of elk that can be wintered on private land without causing unacceptable problems for landowners must be considered in determining the number of elk the Beaverhead Forest should carry. During severe winters, deep snow on the Forest would force elk to move onto the private lands. Private landowners have indicated they would not allow a large increase in grazing pressure by elk on their lands. With the assistance of the Montana Department of Fish, Wildlife and Parks, a reasonable elk number was established as the target or goal for the Forest portion of the winter range. This number is approximately 4,150 elk and is about the number of elk currently utilizing the range. This provides for total elk winter range capacity of 11,650 elk.

The present population of elk summering on the Forest is estimated at approximately 12,200. The summer elk population slightly exceeds the winter population due to elk migration off the Forest slightly exceeding migration onto the Forest in the winter.

5a) Elk Summer Range

Although the availability of winter range is the limiting factor of elk populations, hunting season security cover is necessary to provide a stable trend in hunting recreation. Elk become increasingly vulnerable to harvest as access increases and cover decreases from current levels. As cover decreases and more elk are harvested, the Montana Department of Fish, Wildlife and Parks may impose more restrictive seasons to maintain desirable populations. Elk cover is evaluated using two methods. (The evaluation is displayed in Chapter II, in the alternative comparison section, and the procedures are explained in Appendix B, section III F).

The Minimum Level Benchmark maintains the existing level of elk effective cover at 1,180,000 acres.

6) Fisheries

The biological potential for stream and lake fisheries on the Forest is estimated to be 906,000 catchable trout (426,000 lake potential and 480,000 stream potential). The biological potential is impacted by numerous factors including fishing pressure, fishing regulations, private land management practices, and National Forest management practices. The existing population potential is less than the biological potential as a result of past and current management activities. The existing population potential is estimated to be approximately 750,000 catchable trout (426,000 lake fish and 324,000 stream fish). Management activities assumed to have the greatest potential for impacting fisheries habitat and potential populations are: range management practices, timber harvest, road construction within the riparian zone, and fisheries habitat improvements. The population potential of lake fisheries is not assumed to be impacted by the management activities described above. Therefore, discussion of habitat potential and opportunities for improving habitat focuses on stream fisheries. Opportunities to increase stream fish population potential from the existing situation exist through improved range management practices in riparian areas and fisheries habitat improvement projects.

Many of the streams on Forest lands are an important source of spawning habitat for the downstream fisheries including, the Beaverhead, Madison, Big Hole, Wise, and Ruby Rivers. It is estimated that the Forest annually produces 157,350 adult fish available for recruitment to these fisheries. The same management activities described above have the potential to affect the number of fish available for recruitment.

Demand for fisheries is expected to increase as fishing RVD's increase over time. The objectives identified in the Regional Guide are 116,000 catchable trout in 1981 and 177,000 catchable trout in the year 2000. The analysis of the management situation indicates fisheries habitat potentials well above the objectives of the Northern Regional Guide.

7) Timber

The land base identified as tentatively suitable for timber production totals 809,400 acres. The Maximum Timber Benchmark has a suitable timber base of 804,200 acres, approximately 38 percent of the National Forest, or 99 percent of the land identified as tentatively suitable. In the Maximum PNV Benchmark the suitable timber base is 730,000 acres, indicating that on 79,400 acres, management for timber production is not cost efficient, given a nondeclining flow constraint. With removal of the nondeclining flow requirement and utilization of sequential bounds linking decades with only 20 percent fluctuation allowed, the suitable land base is still 730,000 acres. In the Current Direction benchmark the suitable land base is 506,700 acres.

The Alternatives are evaluated as to their ability to meet RPA objectives as assigned in the Region One Guide. The objectives assigned for annual programmed sale offerings in millions of board feet are shown in Table II-2.

Table II-2 (RPA Timber Sale Offering Objectives in MMBF)

1985	1986 1990	1991 2000	2001 2010	2011 2020	2021 2030
25	31	36	40	44	49

All RPA objectives for decades 1 through 5 can be met by both the Maximum Timber Benchmark and the Maximum PNV Benchmark. The long-term sustained yield capacity of the Maximum Timber Benchmark is 22.7 MMCF (68.1 MMBF) with a first decade harvest of 19.8 MMCF (53.5 MMBF). The long-term sustained yield capacity of the Maximum PNV Benchmark is 17.3 MMCF (51.9 MMBF) with a first decade harvest of 17.3 MMCF (55.4 MMBF). The long-term sustained yield capacity of the Current Direction Benchmark is 10.2 MMCF (29 MMBF) with a first decade harvest of 10 MMCF (37.6 MMBF).

(In several of the alternatives and benchmarks, board foot timber harvest exceeds board foot long-term sustained yield capacity. This is due to larger board foot/cubic foot conversion ratios resulting from the harvest of larger diameter trees in the early decades.)

The timber harvest potential on currently roaded lands is represented by the Maximum Wilderness Benchmark which designates all inventoried roadless lands as wilderness, removing them from consideration for timber management. The long-term sustained yield capacity of the Maximum Wilderness Benchmark is 8.3 MMCF (25.7 MMBF) per year.

In the Minimum Management Benchmark, only volume currently under contract is harvested.

The Forest currently receives bids for offered timber from local mills in the Dillon area, mills in the Bitterroot area, and in Idaho. The East Zone Timber Program Analysis conducted by the Forest Service in 1978 estimates the total milling capacity of the mills in the local area at approximiately 35.4 MMBF per year. The production potential of nonlocal mills is unknown.

8) Present Net Value

The maximum PNV of the Beaverhead National Forest is 298 million dollars as defined by the Maximum PNV Benchmark. This benchmark meets minimum management requirements, legal constraints such as those precluding harvest in classified wilderness, and nondeclining flow requirements.

(The maximum PNV of the Forest using a different set of assumptions about the current and future value of the timber resource is discussed in Appendix B, section IV,B,3,a.)

9) Discounted Costs

The minimum discounted costs of management of National Forest System lands is represented by the Minimum Management Benchmark. Minimum costs total 72 million dollars.

10) Employment

Local employment associated with the resources produced from Beaverhead National Forest encompasses about 1,073 jobs. First decade Forest-related employment ranges from 620 in the Minimum Level Benchmark to 1,441 jobs in the Maximum Timber Benchmark.

3. Range of Alternatives

a. Information Used to Develop Alternatives

The benchmarks presented in the previous section are used to develop alternatives that represent a range of resource outputs. For example, the Maximum Timber and Minimum Level Benchmarks show the timber base sale schedule ranging from a minimum of zero to 53.5 MMBF (19.8 MMCF) per year in decade 1. Alternatives were then designed to span the benchmark range while meeting policy constraints such as riparian area protection and minimum acceptable harvest levels. The Maximum PNV Benchmark was used to determine the cost of meeting alternative objectives and provided a basis for changing alternative activities to optimize PNV while still meeting the objectives. The Current Direction benchmark was used to develop the current program or no action alternative.

The benchmark analysis also aided in addressing the broad range of public issues and management concerns. The issues and concerns centered around livestock forage production, mineral exploration and development, timber production and where it occurs, recreation opportunities, habitat for wildlife and fish, road access to the Forest, and wilderness designation.

The alternatives considered a range from emphasizing resources that are priced and have market outputs, to emphasizing nonpriced outputs. There was considerable effort put into developing feasible solutions that have a variety of resource production levels, as well as in considering roadless areas for wilderness designation, unroaded management or for other resource management. The roadless area evaluation principles (Peterson, 1983) were followed to develop a range of roadless designations spanning all wilderness to all nonwilderness. One alternative--Alternative B-- is designed to meet the Resource Planning Act (RPA) objectives identified in the Northern Regional Guide.

b. Adequate Range of Alternatives

An adequate range of alternatives was developed by first formulating the alternatives that were required by the regulations or policy. This included alternatives that reflected the current program (represented by Alternative A), recommended wilderness classification for all roadless lands (Alternative I), recommended no additional wilderness classification (Alternative B), response to the 1980 RPA program (Alternative B), and recommended wilderness classification for a substantial portion of the roadless area while maximizing commodity production on the remainder of the Forest (Alternative C).

These alternatives were examined to determine where they fit in the range of outputs expressed by the benchmarks and the degree to which they were responsive to the issues and concerns.

Additional alternatives were developed that filled in "gaps" in the range of alternatives and that responded in different ways to the issues and concerns. To the extent possible all alternatives were built from the array of alternatives considered in the development of the 1982 Forest Plan DEIS. Necessary modifications were designed to improve the modeling of the goals and objectives of the alternative or to expand the range of options being explored.

All of the alternatives considered are implementable options for management of the Beaverhead National Forest. All are responsive to the issues and concerns, providing alternate ways to address them. All alternatives ensure multiple-use management.

A number of power corridors or energy windows have been located across the Forest. Alternatives are not developed to specifically address these corridors, but will be evaluated to determine conflicts between potential corridor development and proposed land uses (see Chapter IV, section S).

The adequacy of the range of alternatives considered was determined by evaluating them against the benchmarks. This comparison is shown in Figure II-1.

Summary of changes since the Revised Draft EIS

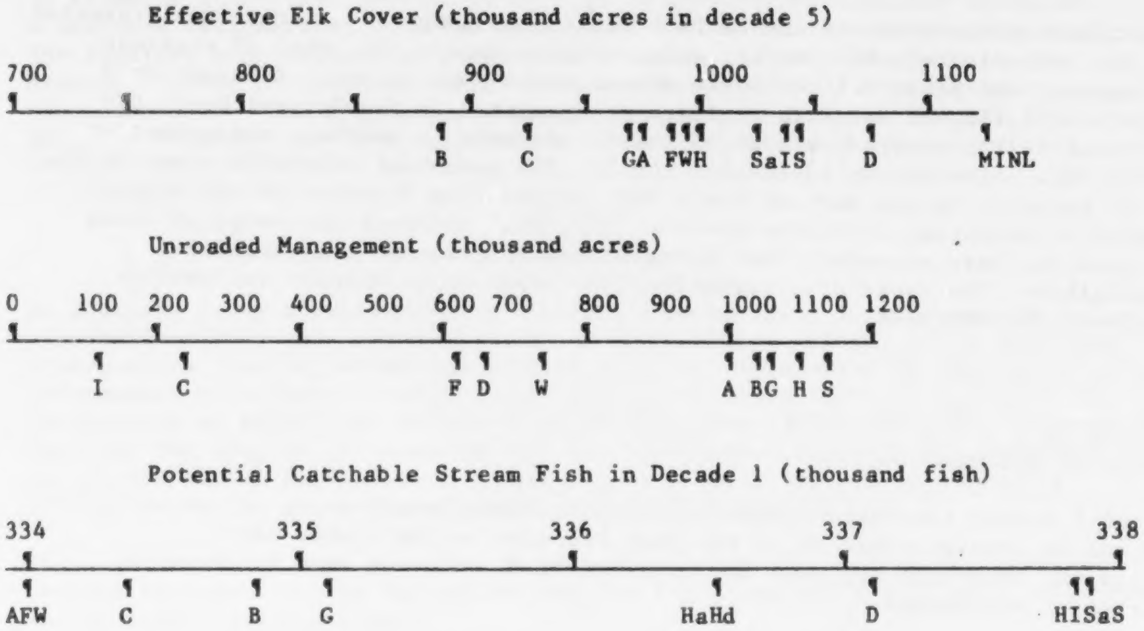
Additional alternatives S and Sa fall within the range of alternatives presented in the Revised Draft EIS for all major outputs except the level of roadless management and potential catchable stream trout populations. Alternative S maintains 1,136,400 acres in roadless management. In the Revised Draft EIS Alternative H proposed the highest amount of lands in roadless management at 1,115,800. Alternative S provides for 337,900 potential catchable trout in the first decade. In the Revised Draft EIS, Alternative H projected the highest number of potential catchable trout at 337,800. Although the range of these outputs has been expanded, the increases are slight, and are considered negligible. The range of alternatives for other major outputs was neither narrowed nor expanded.

Figure II-1
Range of Alternatives

H and S retain the West Pioneer in custodial management.
Ha and Sa retain a portion of the West Pioneers in the timber base.
H# is the departure analysis for alternative H, with the West Pioneers in custodial management.

```
     Recommended Wilderness and Classified Wilderness (thousand acres)

0    100  200  300  400  500  600  700  800  900  1000 1100 1200 1300
¶_________¶_________¶_________¶_________¶_________¶_________¶__________
¶        ¶  ¶   ¶¶¶       ¶     ¶              ¶      ¶               ¶
         B  G   AHS       W     F              D      C               I


          Scheduled Timber Volume (MMCF in decade 1)

                     5                   10                  15
_____________________¶___________________¶___________________¶_________
¶                      ¶¶¶   ¶   ¶¶ ¶¶       ¶¶¶ ¶     ¶              ¶
MIN LVL                DSSa  H   IHaCA       BFH#W     G          Max PNV


          Domestic Livestock Grazing (AUM's in decade 1)

0---       180                      190                      200  --231
¶__________¶________________________¶________________________¶__________¶
¶        ¶     ¶    ¶ ¶  ¶        ¶ ¶¶  ¶ ¶    ¶           ¶          ¶
MIN LVL  I     C    B G  D        SaSA  F H    W           H#      Max Range
```

Figure II-1 (Continued)



Analysis of these comparisons showed that there was an adequate range of resource outputs and proposed land uses. The range of alternatives considered for domestic livestock grazing was limited in that no alternatives displayed consider production of AUM's much below current level. Output levels lower than current were considered in detail during alternative formulation and dismissed. The analysis conducted during alternative formulation indicated that no specific conflict existed; i.e, livestock grazing versus forage available on elk winter range, use of riparian areas, social and economic implications, that could not be resolved by allotment management planning.

c. Constraints Used to Develop Alternatives

All Alternatives have a set of common constraints that are used in their FORPLAN analyses. While each Alternative has a unique goal, there are a number of limitations that must be applied to achieve objectives or requirements that are common to all Alternatives.

Mitigation measures were incorporated into all management prescriptions, as well as management standards, guidelines, and minimum management requirements already discussed. These are also discussed in Appendix B, Sections III-D and VI-B.

Common constraints applied in FORPLAN are discussed in detail in Appendix B, Section VII-B, and are only briefly summarized below.

The common constraints used to meet alternative objectives are:

A timber harvest, nondeclining flow constraint.

A timber ending inventory constraint.

A minimum rotation age for timber

Existing wilderness acres is maintained and not available for harvest.
Acres recommended for wilderness classification are not available for timber harvest.

Meet minimum management requirements.

All alternatives use only winter range prescriptions for critical elk winter ranges to ensure that forage and security needs for elk populations are met. This ensures that 35 percent of plant production is available for wildlife consumption on winter range.

Timber harvest in riparian areas is limited to uneven-aged systems to protect riparian vegetation and fish.

Livestock forage utilization on suitable rangeland ensures that at least 35 percent of the forage produced is reserved from consumption by livestock to maintain plant vigor.

The West Pioneer Montana Wilderness Study Act Area is assigned "nonwilderness" management prescriptions in all alternatives except Current Direction. This is the recommendation of the Taylor-Hilgard, Mt Henry, West Pioneer Wilderness Study Act EIS.

Recreation visitor days are valued only up to the expected levels of demand.

Road densities and logging systems are tied to land class and management prescriptions.

Summary of changes since the Revised Draft EIS

Constraints common to all alternatives remain unchanged. Additional constraints were applied to alternatives S and Sa in an attempt to reflect additional concerns. These constraints are presented in the description of these alternatives.

C. Description of Alternatives

Summary of changes since the Revised Draft EIS

Two additional alternatives were developed in response to public comment, internal analysis requirements, additional management concerns, and refinement of existing data. These alternatives, designated Alternatives S and Sa, were developed from Alternatives H and Ha, incorporating those changes described above. Narratives for these alternatives have been added.

Calculations for all alternatives displaying the decrease in elk effective cover from existing to that projected at the end of the fifth decade erroniously used 1,118,000 acres as the existing level. The correct figure is 1,180,000. All displays and discussions have been corrected.

1. **Alternative A** (Current Level of management)

The goal of this alternative is to continue the management direction provided by the 1978 Beaverhead Land Management Plan. The alternative was constrained to a budget level equal to the average budget received on the Forest in fiscal years 1980 through 1982. The current level alternative meets the NEPA and National Forest Management Act requirements for development of a "no action" alternative, exhibiting no change from existing direction for resource production and management.

a. Range

The objective of this alternative is to maintain the current levels of domestic livestock use on permanent rangelands. Available forage in the first decade equals the current use of 190,000 AUM's per year, and fluctuates slightly upward in the following decades to as high as 201,000 AUM's per year. These increases are associated with transitory range created through timber harvest activities. This alternative meets RPA objectives for the range program in the first decade, is within 10 percent the second decade then falls below objectives in the succeeding decades.

b. Timber

This alternative maintains the current timber harvest base sale schedule of 29.4 MMBF per year. The actual current target for the Forest is approximately 25.5 MMBF per year, but that does not include outputs from the West Pioneer Montana Wilderness Study Area. The long-term sustained yield capacity is 31.3 MMBF per year. Approximately 535 thousand acres, or 66 percent of the tentatively suitable timberland is managed for scheduled timber production. This is the eighth lowest of the alternatives. The allowable sale quantity of Alternative A meets at least 85 percent of the timber output RPA objectives in the first three decades.

c. Wilderness

This alternative reflects the decisions of RARE II, recommending portions of the East Pioneers, North Big Hole, Storm Lake, and West Big Hole for wilderness classification. Areas recommended for further planning are Italian Peak, Middle Mountain Tobacco Roots, and Mt. Jefferson. The West Pioneers area is a Montana Wilderness Study Act area and is deferred from management activities until a final decision on wilderness classification is made. In this alternative, approximately 13 percent of the Forest's inventoried roadless acres are recommended for wilderness classification. Existing classified wilderness areas are managed at the reduced service level.

d. Minerals

Existing oil and gas leases have been processed under the quidelines of the "Environmental Assessment on Oil and Gas Leasing on Nonwilderness Land" which is incorporated by reference to this EIS. All lands except those covered by a formal withdrawal are available for mineral access. This alternative recommends a relatively small number of acres for wilderness compared to others; however, portions of the East Pioneers, West Big Hole, and Storm Lake have high or very high favorability for nonenergy minerals. These areas would be withdrawn from mineral entry or mineral leasing if classified as wilderness. New mineral leases and subsequent lease reissuance will undergo additional analysis as required by NEPA, tiering to this EIS through incorporation by reference the information presented in this EIS. Special stipulations are used whenever the leased area has surface resource values needing special protection to meet the alternative management objectives.

e. Elk Habitat Potential

This alternative provides sufficient acres of effective cover and winter forage to maintain a reasonable summer population potential of 12,200 elk on National Forest lands. The reasonable population has been determined in conjunction with Montana Department of Fish, Wildlife, and Parks to be the population which will not cause significant conflicts with private land owners when the elk are on the winter range.

Elk effective cover is reduced in this alternative from the existing 1,180,000 acres to 973,000 by the fifth decade, a decrease of 17 percent. As overall elk security is decreased, the possibility of more restrictive hunting regulations increases. The total timber harvest in the first five decades is 1,718 MMBF, with a total suitable timber base of 535,000 acres. This results in an intensity index of 32.1 representing the potential of the timber harvest program to affect key elk habitat components. Alternative A has a moderate impact on elk security based on these analyses of effective cover and harvest intensity.

Elk hunter days are a function of road density and hiding cover. The number of use days projected for this alternative constitutes a reduction from the existing annual level of 66,425 to 62,440 by the fifth decade, a decrease of six percent.

f. Fisheries

Alternative A increases potential catchable stream trout populations from the existing level of 324,000 to 334,000 in decade 1 then decreases to 326,500 in decade 5. Increases over estimated existing population potential in the first decade result from implementation of allotment management plans and habitat improvement projects. The potential population in the fifth decade is the lowest of the alternatives.

It is estimated that the Forest currently produces 157,350 adult fish which are available for recruitment to the downstream fisheries. This number increases by 4,600 in the first decade and 630 in the fifth decade in this alternative.

g. Road System

Approximately 3,550 miles of road are needed to complete the system. This includes approximately 91 miles of arterial and collector roads to be built with capital investment funding. The majority of the capital investment roads will be built in the first five decades. Average annual road construction in the first decade is approximately 52 miles. The Forest will continue to acquire rights-of-way across other ownerships to access Forest lands for resource development.

h. Economic Costs and Benefits

Proposed land uses associated with Current Direction were not guided by economic efficiency but by the existing land management plan, resulting in some decrease in PNV from that which might be expected if cost efficiency criteria guided those land uses. Still, timber costs are moderate compared to other alternatives and timber benefits are also moderate, reflecting the timber harvest program level. The PNV of this alternative is $196 million.

i. Socioeconomic and Social Impacts

Usually the negative social and socioeconomic impacts associated with continuation of Current Direction are the lowest of all the management alternatives that could be considered, unless management activities are leading in a direction the public would find unacceptable. The timber and range programs appear to meet the needs of the public in terms of outputs; however, timber harvest in the early decades is scheduled in high value mixed conifer stands, leaving lower value lodgepole pine stands for harvest in later decades. If mountain pine beetle infestations damage large acreages of lodgepole pine, impacts on the timber industry could occur.

As planned development of roadless areas progresses in this alternative, land use patterns will be altered. Additional motorized access will be available but primitive or semiprimitive environments will be lost.

2. Alternative B

The goal of this alternative is to maximize present net value while achieving high commodity resource production levels. This alternative is the alternative that is responsive to the 1980 RPA Program objectives. This alternative does not recommend any additional wilderness classification for the Forest.

a. Range

This alternative is designed to attempt to meet or exceed the RPA ojectives for domestic livestock use over the next fifty years. The AUM's produced in decade one are 184,000, approximately 5 percent less than RPA objectives and less than Current Direction. However, through decade four the AUM's provided are within 10 percent of the RPA objectives and more than Current Direction. By decade five, RPA objectives for the range program cannot be met with 10 percent and AUM's provided are 21 percent below the RPA objective.

In attempting to also meet RPA targets for timber production, this alternative assigns a large number of acres to intensive timber prescriptions. These prescriptions preclude the use of transitory range, thus the number of AUM's is lower in this alternative than others.

b. Timber

The intent of Alternative B was to to meet or exceed the RPA objectives for the scheduled timber harvest program over the next fifty years. RPA objectives for decade one are exceeded with a scheduled timber harvest level of 33.8 MMBF per year, and a long-term sustained yield capacity of 49.2 MMBF per year. RPA objectives for decades six through ten are also met or exceeded. The timber harvest program occurs on approximately 653,000 acres, or 81 percent of the tentatively suitable timber land.

c. Wilderness

This alternative does not recommend any additional wilderness classification for inventoried roadless areas. The Lee Metcalf and Anaconda-Pintler Wilderness Areas will remain classified as wilderness.

d. Minerals

All lands currently not covered by formal withdrawal are available for mineral access. A high level of access opportunity is provided in that no additional areas will be formally withdrawn and development activities receive high priority. None of the existing classified wilderness areas have high or very high geologic favorability for nonenergy or energy minerals. New mineral leases and subsequent lease reissuance will undergo additional analysis as required by NEPA, tiering to this EIS through incorporation by reference the information presented in this EIS. Special stipulations are used whenever the leased area has surface resource values needing special protection to meet the alternative management objectives.

e. Elk Habitat Potential

This alternative provides sufficient acres of effective cover and winter forage to maintain a reasonable summer population potential of 12,200 elk on forest lands. The reasonable population has been determined in conjunction with Montana Department of Fish, Wildlife, and Parks to be the population which will not result in conflicts with private landowners when the elk are on the winter range.

Elk effective cover is reduced from the existing 1,180,000 acres to 887,000 by the fifth decade, a decrease of 25 percent. The potential for more restrictive hunting regulations increases as overall elk security is decreased. The total timber harvest scheduled in the first five decades is 2,278 MMBF with a suitable timber base of 653,000 acres. This results in an intensity index of 34.9. This index indicates the relative potential of the timber harvest to adversely affect key elk habitat components. Alternative B exhibits the greatest adverse impacts on elk habitat of the alternatives considered.

Elk hunter days are reduced in this alternative from the existing annual level of 66,425 to 59,782 by the fifth decade, a decrease of ten percent.

f. Fisheries

Alternative B increases potential catchable stream trout populations from the existing level of 324,000 to 334,800 in decade 1 with slight decreases to 331,500 in decade 5. Increase occur over estimated existing population potential in the first decade due to implementation of allotment management plans. The potential populations resulting from management activities are lower than for other alternatives but are partially mitigated by fisheries habitat improvement activities.

It is estimated that the Forest currently produces 157,350 adult fish which are available for recruitment to the downstream fisheries. This number increases by 3,300 in the first decade and decreases in the fifth decade by 210.

g. Road System

Approximately 4,324 miles of additional roading is needed to complete the system. This is the largest amount of road construction of any of the alternatives. This includes approximately 112 miles of arterial and collector roads, to be built with capital investment funding. The majority of the capital investment roads will be built in the first five decades. Average annual road construction in the first decade is approximately 64 miles, also the highest of the alternatives. The Forest will continue a program of obtaining right-of-way access to Forest land across other ownerships. Right-of-way acquisition will normally occur in conjunction with planned timber harvest.

h. Economic Costs and Benefits

The PNV of $244 million is the second highest of the alternatives considered. This alternative in achieving at least 90 percent of RPA objectives for timber and range resources contributes high revenues to the federal treasury over the planning horizon. In decade one; however, they are not as high as other alternatives. Timber and road costs are the highest of all alternatives. Discounted timber benefits are also higher than other alternatives.

i. Socioeconomic and Social Impacts

This alternative would be most acceptable to those who would like to have forest resources developed and available for public use. The development of currently unroaded areas in this alternative will, over time, change existing land use patterns. Individuals desiring motorized recreation and easy access to National Forest lands will find improved motorized recreation potential while those seeking a primitive setting will be displaced to areas not capable of timber production or in designated wilderness.

3. Alternative C

The goal of this alternative is to maximize present net value while providing both a significant acreage of roadless areas recommended for wilderness and a significant production level for commodity resources from the remainder of the Forest. This alternative provides for wilderness classification of 75 percent of the roadless areas.

a. Range

This alternative strives to provide a high level of forage production for domestic livestock use over the next fifty years while at the same time providing a substantial amount of wilderness. Permitted grazing will continue in wilderness areas where currently allowed, but will not be allowed where use has not occurred in the past. The potential livestock forage available in the first decade under this alternative is 182,000 AUM's per year. This number increases steadily to 220,000 AUM's in the fourth decade, then drops to 184,000 AUM's per year by the tenth decade. These fluctuations occur mostly as a result of transitory forage created through timber harvest. This alternative does not meet RPA forage targets but remains within 10 percent through the first four decades.

b. Timber

This alternative strives to achieve and maintain a high level of scheduled timber harvest over the next fifty years while recommending wilderness classification for 75 percent of the roadless areas on the Forest. Scheduled timber harvest in the first decade is 25.8 MMBF per year, rises to 33.6 MMBF in the second decade, and up to 40.9 MMBF per year by the fourth decade. The long-term sustained yield capacity is 42.3 MMBF per year. RPA objectives are not met. The timber harvest program occurs on approximately 537,000 acres, or 66 percent of the tentatively suitable timber land. Much of the suitable acres scheduled for access are those already developed for timber harvest. Due to the high amount of harvest on relatively few acres, a high potential for conflicts with other resource management objectives is possible.

c. Wilderness

This alternative recommends wilderness classification for approximately 75 percent of the inventoried roadless lands on the Forest in addition to the two existing classified wilderness areas. New wilderness recommendations comprise 933,700 acres or 43 percent of the Forest. Recommended areas were selected considering public input, levels of wilderness potential, and the degree of resource conflicts.

The acres of nonwilderness roadless management in this alternative will be by far the lowest of the alternatives except for Alternative I.

d. Minerals

All lands except those covered by a formal withdrawal are available for mineral access. Due to the large acreages of recommended wilderness, many areas with high or very high favorability for energy or nonenergy mineral resources would be precluded from exploration and development. High or very high nonenergy mineral favorability exists in portions of the East Pioneers, West Big Hole, Tobacco Roots, and Gravelly Mountains. High or very high energy mineral favorability exists in the Italian Peaks area, Gravelly Mountains, Snowcrest Range and Lima Peaks area. New mineral leases and subsequent lease reissuance will undergo additional analysis as required by NEPA, tiering to this EIS through incorporation by reference the information presented in this EIS. Special stipulations are used whenever the leased area has surface resource values needing special protection to meet the alternative management objectives.

e. Elk Habitat Potential

This alternative provides sufficient acres of effective cover and winter forage to maintain a reasonable summer population potential of 12,200 elk on Forest lands. The reasonable population has been determined in conjunction with Montana Department of Fish, Wildlife, and Parks to be the population which will not result in conflicts with private landowners when the elk are on the winter range.

Elk effective cover is reduced from the existing 1,180,000 acres to 921,000 by the fifth decade, a decrease of 22 percent. As overall elk securiy is decreased, the possibility of more restrictive hunting regulations increases. The total timber harvest scheduled in the first five decades is 1,786 MMBF with a suitable timber base of 537,000 acres. This results in an intensity index of 33.3. This index indicates the relative potential of the scheduled timber harvest to adversely affect key elk habitat components. Alternative C has the second largest decrease in elk effective cover but the seventh best intensity index, indicating a moderate potential for conflict.

Elk hunter days are reduced in this alternative from the existing annual level of 66,425 to 60,447 by the fifth decade, a decrease of nine percent.

f. Fisheries

Alternative C increases potential catchable stream trout populations from the existing level of 324,000 to 334,400 in decade 1 with slight decreases to 326,600 in decade 5. Increase occur over estimated existing populations in the first decade due to implementation of allotment management plans. The potential populations resulting from management activities are lower than for other alternatives but adverse impacts are partially mitigated by fisheries habitat improvement activities.

It is estimated that the Forest currently produces 157,350 adult fish which are available for recruitment to the downstream fisheries. This number increases by 4,600 in the first decade and 325 in the fifth decade.

g. Road System

Approximately 3,570 miles of additional roading is needed to complete the Forest transportation system. The total system miles of road needed for management are among the least of the alternatives considered. Due to the large acreage of recommended wilderness, the majority of timber harvest and associated road construction will occur in areas already accessed with roads. Approximately 108 miles of arterial and collector roads will be built with capital investment funding. The majority of the arterial and collector roads would be built in the first five decades, while the remainder of the local road system would be completed in the next ten decades. Average annual road construction in the first decade is approximately 53 miles. The Forest will continue a program of obtaining right-of-way access to Forest land across other ownerships. Right-of-way acquisition will normally occur in conjunction with planned timber harvest.

h. Economic Costs and Benefits

This alternative provides a substantial acreage recommended for wilderness classification while maintaining high commodity outputs on nonwilderness lands. PNV is sixth from the lowest of the alternatives at $170 million. Timber costs are second highest in the alternatives, indicating the level of investment necessary to maximize timber production on a limited suitable land base. Timber benefits associated with that investment, the benefit/cost relationship, is substantially lower than that for other alternatives. The total benefit/cost ratio for this alternative is the lowest of all the alternatives.

i. Socioeconomic and Social Impacts

While this alternative would appear to meet the needs of both wilderness and resource development advocates, the associated tradeoffs have impacts on other constituencies. Motorized recreationists seeking a backcountry environment would be excluded from 75 percent of the currently inventoried roadless lands while much of the remainder of the Forest would be intensively roaded and developed, eliminating backcountry qualities. Big game hunting opportunities would change dramatically from the existing situation with a Forest that is either classified wilderness or intensively developed with little in between the two extremes.

4. Alternative D

The goal of this alternative is to maximize present net value while emphasizing recreation opportunities and the protection and maintenance of elk habitat. This alternative focuses on the amenity resources, such as recreation and wildlife, by restricting timber harvest to areas that have already been developed and by recommending about 62 percent of the inventoried roadless acres on the Forest for wilderness classification.

a. Range

This alternative provides forage for domestic livestock while being highly responsive to the needs of wildlife, particularly big game forage. The amount of forage available to livestock on winter ranges is constrained. Potential livestock forage is 186,000 AUM's per year in decade one. This number increases slightly through decade six to 193,000 AUM's per year. The majority of increases result from transitory forage created through timber harvest. This alternative does not meet RPA objectives in any decade, but is within 10 percent of the RPA objectives in decades one and two.

b. Timber

This alternative concentrates timber harvest activities in areas already accessed and developed for timber production. Timber harvest activities are scheduled and designed to ensure adequate maintenance of thermal and hiding cover for big game. The first decade allowable sale quantity is 18.8 MMBF per year, with a long-term sustained yield capacity of 18.6 MMBF. Approximately 313,000 acres, or 39 percent of the tentatively suitable timber lands are suitable for scheduled timber production. The RPA objectives for the Forest are not met.

c. Wilderness

This alternative recommends wilderness classification for approximately 62 percent of the inventoried roadless lands in addition to the two existing classified wilderness areas. This constitutes an additional 772,400 acres or 36 percent of the Forest into wilderness classification. Due to the constraint that precludes timber harvest from currently undeveloped lands, a large number of acres on the Forest would remain unroaded.

d. Minerals

All lands except those covered by a formal withdrawal are available for mineral access. Mineral exploration and development would be precluded from 62 percent of the inventoried roadless acres recommended for wilderness classification. Portions of the East Pioneers, Gravellys, Tobacco Roots, and West Big Hole are identified as having high or very high nonenergy mineral favorability and portions of the Italian Peaks, Gravellys, Snowcrest Range and Lima Peaks area have high or very high energy mineral favorability. The maintenance of unroaded acres additional to the classified wilderness in this alternative make mineral exploration and development more difficult than if the areas were being accessed for timber harvest activities. New mineral leases and subsequent lease reissuance will undergo additional analysis as required by NEPA, tiering to this

EIS through incorporation by reference the information presented in this EIS. Special stipulations are used whenever the leased area has surface resource values needing special protection to meet the alternative management objectives.

e. Elk Habitat Potential

This alternative provides sufficient acres of effective cover and winter forage to maintain a reasonable summer population potential of 12,200 elk on forest lands. The reasonable population has been determined in conjunction with Montana Department of Fish, Wildlife, and Parks to be the population which will not result in conflicts with private landowners when the elk are on the winter range.

Elk effective cover is reduced from the existing 1,180,000 acres to 1,078,000 by the fifth decade, a decrease of 9 percent. As overall elk securiy is decreased, the probability of more restrictive hunting regulations increases. The total timber harvest scheduled in the first five decades is 940 MMBF with a suitable timber base of 313,000 acres. This results in an intensity index of 30.0. This index indicates the relative potential of the timber harvest to adversely affect key elk habitat components. Alternative D has the least impact on elk security based on these analyses than any of the alternatives.

Elk hunter days are reduced in this alternative from the existing annual level of 66,425 to 63,768 by the fifth decade, a decrease of four percent.

f. Fisheries

Alternative D increases potential catchable stream trout populations from the existing level of 324,000 to 337,100 in decade 1 with slight decreases to 335,600 in decade 5. Increase occur over estimated existing populations in the first decade due to implementation of allotment management plans. The potential populations resulting from management activities are fifth highest of the alternatives considered due to less timber harvest and habitat improvement activities.

It is estimated that the Forest currently produces 157,350 adult fish which are available for recruitment to the downstream fisheries. This number increases by 5,320 in the first decade and 3,510 in the fifth decade. These are the greatest increases of the alternatives considered.

g. Road System

Approximately 1,965 miles of road are needed to complete the system. This is the lowest total road mileage needed of the alternatives considered. Road mileage needed to complete the system includes approximately 50 miles of arterial and collector roads to be built with capital investment funding. The majority of the arterial and collector roads will be built in the first five decades. Average annual road construction in the first decade is approximately 30 miles, roughly half the construction mileage of most the other alternatives with the exception of Alternative H. The Forest will continue a program of obtaining right-of-way access to Forest land across other ownerships. Right-of-way acquisition will normally occur in conjunction with planned timber harvest.

h. Economic Costs and Benefits

This alternative has the lowest PNV of all the alternatives primarily due to the low timber harvest program. The PNV is $136 million. Timber benefits are the second lowest of the alternatives; however, benefits associated with other resources remain as high as in other alternatives. Capital investment needs are the lowest of the alternatives, reflecting the concentration of activities in already developed areas.

i. Socioeconomic and Social Impacts

This alternative has the highest potential for maintaining current land use patterns. No additional areas are developed and traditional activities could continue except in roadless areas recommended for wilderness classification that have received motorized use. The timber harvest level would decline from the existing situation with potential adverse impacts on the local timber industry.

5. Alternative F

The goal of this alternative is to maximize present net value while emphasizing active wildlife habitat improvement activities including timber harvest designed to enhance or maintain habitat components. This alternative also provides for timber harvest and livestock forage utilization where suitable. Where inventoried roadless area resource values, especially wildlife, can be best managed through wilderness classification, wilderness is recommended.

a. Range

The objective of this alternative is to emphasize wildlife habitat improvement while providing for domestic livestock forage utilization where appropriate. Competition between livestock and elk on winter ranges will be minimized. Potential livestock forage fluctuates from 192,000 AUM's per year in the first decade to a maximum of 204,000 AUM's per year in the sixth decade. Fluctuations result from increases in transitory forage generated through timber harvest. RPA objectives are met, within 10 percent the first two decades then fall below in the later decades.

b. Timber

This alternative schedules timber harvest in the most cost-efficient manner possible within constraints designed to protect wildlife habitat, including elk security cover. Scheduled timber harvest in decade one is 36.2 MMBF. The long-term sustained yield capacity is 35.3 MMBF. Scheduled timber harvest in decade one is higher than the long-term sustained yield capacity only due to the variations in board foot cubic foot conversion ratios. The first decade cubic foot harvest does not exceed the cubic foot long-term sustained yield capacity. Approximately 609,000 acres, or 75 percent of the tentatively suitable timber lands are suitable for scheduled timber production. The RPA objectives for timber are met in the first two decades.

c. Wilderness

This alternative recommends wilderness classification for approximately 37 percent of the inventoried roadless lands in addition to the two existing classified wilderness areas. This constitutes 455,700 acres or 21 percent of the Forest.

d. Minerals

All lands except those covered by a formal withdrawal are available for mineral access. The wilderness recommendations of this alternative would increase the acreage covered by formal withdrawal. Areas having high or very high geologic favorability for nonenergy minerals proposed for withdrawal include portions of the East Pioneers, Tobacco Roots and West Big Hole areas. Areas having high or very high energy mineral favorability proposed for withdrawal include the Italian Peaks, Lima Peaks and Snowcrest Mountains. Nonwilderness lands will be available for exploration and development; however, some scheduling restrictions may be imposed to protect the wildlife resource. New mineral leases and subsequent lease reissuance will undergo additional analysis as required by NEPA, tiering to this EIS through incorporation by reference the information presented in this EIS. Special stipulations are used whenever the leased area has surface resource values needing special protection to meet the alternative management objectives.

e. Elk Habitat Potential

This alternative provides sufficient acres of effective cover and winter forage to maintain a reasonable summer population potential of 12,200 elk on forest lands. The "reasonable" population has been determined in conjunction with Montana Department of Fish, Wildlife, and Parks to be the population which will not result in conflicts with private landowners when the elk are on the winter range.

Elk effective cover is reduced from the existing 1,180,000 acres to 982,000 by the fifth decade, a decrease of 17 percent. The possibility of restrictive hunting regulations increases as elk effective cover is reduced. The total timber harvest scheduled in the first five decades is 1,810 MMBF with a suitable timber base of 609,000 acres. This results in an intensity index of 30.6. This index indicates the relative potential of the timber harvest to adversely affect key elk habitat components. Alternative F has the third best coefficient for intensity of timber harvest. The decrease in effective cover has only a moderate effect of elk security, and is similiar to Alternative A.

Elk hunter days are reduced in this alternative from the existing annual level of 66,425 to 62,440 by the fifth decade, a decrease of six percent.

f. Fisheries

Alternative F increases potential catchable stream trout populations from the existing level of 324,000 to 334,000 in decade 1 with slight decreases to 330,700 by decade 5. Increases occur over estimated existing population potential in the first decade due to implementation of allotment management plans. The potential populations resulting from management activities in this alternative are low in the array of alternatives considered.

It is estimated that the Forest currently produces 157,350 adult fish which are available for recruitment to the downstream fisheries. This number increases by 3,330 in the first decade and 140 in the fifth decade.

g. Road System

Approximately 4,103 miles of additional road are needed to complete the Forest transportation system. This includes approximately 112 miles of arterial and collector roads to be built with capital investment funding. The majority of the arterial and collector roads will be built in the first five decades, while the local road system should be completed in ten decades. Average annual road construction in the first decade is approximately 61 miles. The Forest will continue a program of obtaining right-of-way access to Forest land across other ownerships. Right-of-way acquisition will normally occur in conjunction with planned timber harvest.

h. Economic Costs and Benefits

This alternative has a relatively high PNV due to the high level of programmed timber harvest. The PNV is $200 million. Road needs and costs are very high in this alternative relative to the timber revenues, due to the need to distribute harvest throughout the suitable land base to minimize wildlife impacts.

i. Socioeconomic and Social Impacts

This alternative maintains a range and timber program which will not adversely impact local industry, yet strives to provide a wildlife population and level of wilderness designation that responds to public demands. Conflicts between motorized use established for certain areas and wilderness classification surface in this alternative. Nonwilderness areas suitable for timber production will be accessed and developed. To protect wildlife hiding cover, development of a larger area with less intensive management is required. Existing land use patterns may be altered.

6. Alternative G

The goal of this alternative is to maximize present net value with few constraints that detract from opportunities to manage in a cost-efficient manner. Recommended additions to the wilderness system are limited to small areas adjacent to existing wilderness areas, or proposed by other Forests.

a. Range

The objective of this alternative is to emphasize domestic livestock grazing where it is cost efficient to do so. Potential livestock forage scheduled in decade 1 is 185,000 AUMs per year. This figure increases to 197,000 AUM's per year by decade four. Increases result mostly from transitory forage produced through timber harvest. RPA objectives are not met; however, potential production in the first two decades exceeds 90 percent of the scheduled objective.

b. Timber

This alternative schedules timber harvest in the most cost-efficient manner possible with few imposed constraints. Intensive harvest prescriptions are scheduled in the high productivity timber stands. Timber harvest scheduled in decade 1 is 43.6 MMBF per year. This is the largest first decade harvest of the alternatives considered. The long-term sustained yield capacity is 41.2 MMBF per year. Approximately 548,000 acres, or 68 percent of the tentatively suitable timber lands are scheduled for timber production. The RPA objectives for the Forest are met within 10 percent in the first four decades.

c. Wilderness

This alternative recommends wilderness classification for approximately 5 percent of the inventoried roadless lands in addition to the two existing classified wilderness areas. Proposed new wilderness designations comprise 62,000 acres or 3 percent of the Forest.

d. Minerals

All lands except those covered by a formal withdrawal are available for mineral access. Under this alternative a relatively open level of access is available for mineral exploration and development because of the limited amount of additional wilderness recommended for classification and because of the cost-efficient objectives that guide overall Forest management. New mineral leases and subsequent lease reissuance will undergo additional analysis as required by NEPA, tiering to this EIS through incorporation by reference the information presented in this EIS. Special stipulations are used whenever the leased area has surface resource values needing special protection to meet the alternative management objectives.

e. Elk Habitat Potential

This alternative provides sufficient acres of effective cover and winter forage to maintain a reasonable summer population potential of 12,200 elk on forest lands. The reasonable population has been determined in conjunction with Montana Department of Fish, Wildlife, and Parks to be the population which will not result in conflicts with private landowners when the elk are on the winter range.

Elk effective cover is reduced from the existing 1,118,000 acres to 971,000 by the fifth decade, a decrease of 18 percent. Generally, reductions in overall elk security increase the possibility of more restrictive hunting regulations. The total timber harvest scheduled in the first five decades is 2,180 MMBF with a suitable timber base of 548,000 acres. This results in an intensity index of 39.8. Due to intensive harvest in a relatively small timber base, the index is high, and potential of adverse impact to key wildlife habitat components is high.

Elk hunter days are reduced in this alternative from the existing annual level of 66,425 to 61,111 by the fifth decade, a decrease of eight percent.

f. Fisheries

Alternative G increases potential catchable stream trout populations from the existing level of 324,000 to 335,100 in decade 1 with slight decreases to 329,300 by decade 5. Increases occur over estimated existing populations in the first decade due to implementation of allotment management plans. The potential populations resulting from management activities are moderate in the array of alternatives considered.

It is estimated that the Forest currently produces 157,350 adult fish which are available for recruitment to the downstream fisheries. This number increases by 4,415 in the first decade and 670 in the fifth decade.

g. Road System

Approximately 3,550 additional miles of road are needed to complete the Forest transportation system. This includes approximately 112 miles of arterial and collector roads to be built with capital investment funding. The majority of the arterial and collector roads will be built in the first five decades, while the local road system should be completed in ten decades. Average annual road construction in the first decade is approximately 53 miles. The Forest will continue a program of acquiring right-of-way access across other ownerships to access Forest lands for resource development.

h. Economic Costs and Benefits

This alternative has the highest PNV of all the alternatives. This is a result of the limited restrictions on resource development opportunities. The benefit/cost ratio is highest also. The PNV of this alternative is $249 million and the opportunity costs are $49 million. Timber costs are not as high as for the other alternatives but the benefits generated by that investment are second highest. Nonmarket recreation benefits are the same as for the other alternatives.

i. Socioeconomic and Social Impacts

This alternative could have impacts in several areas in that nonpriced resource values of concern to people are not highlighted. Hunting opportunities would be adversely affected where intensive development occurs. The timber supply from Forest lands would increase from existing levels, creating opportunities for local industries. Existing land use patterns would be altered. The range program would slightly decline with potential impacts to the local ranching community.

7. Alternative H and Ha

The goal of these alternatives is to maximize present net value while responding to the range of resource use demands and concerns of the public who utilize the Beaverhead National Forest land and resources. These alternatives meet the demand for dispersed and developed recreation, and respond to concerns for wilderness designation in more popular roadless areas. These alternatives schedule early decade timber harvest activities in areas highly susceptible to mountain pine beetle infestations. Elk habitat security is maintained throughout the forest.

The analysis needed to reach this goal was conducted twice with two different assumptions resulting in two alternatives displayed in this DEIS. The first assumption is that the nonwilderness recommendation of the Montana Wilderness Study DEIS for the West Pioneers is accepted by Congress. Alternative Ha incorporates this assumption and the West Pioneers are managed for a variety of nonwilderness uses, including roadless recreation (a recreation management area of 62,000 acres) and timber (a suitable timber base of 55,000 acres). This management direction is displayed in the 1982 Beaverhead National Forest Land and Resource Management Plan. The second assumption is that the nonwilderness recommendation for the West Pioneers is not accepted by Congress or that a decision was not made at the time of Forest Plan implementation. Alternative H incorporates this assumption and the West Pioneers area is held in custodial management. If the nonwilderness recommendation holds, the proposed land uses displayed in alternative Ha (displayed in the 1982 DEIS) will be implemented.

a. Range

The objectives of these alternatives is to emphasize domestic livestock grazing where it is cost efficient to do so and where potential competition with big game forage utilization can be minimized. The potential livestock forage available in decade one under alternative H is 192,000 AUM's per year with slow increases to 209,000 AUM's per year by decade five. The potential livestock forage available in decade one in Alternative Ha is 191,000 AUM's per year. These levels of AUM's are slightly higher than currently allotted. RPA objectives are met in decades one and two.

Some potential AUM's would continue to be generated from transitory range forage outputs. Improved management practices including implementation of rest rotation and deferred grazing systems will be needed to avoid continued impacts to riparian areas and fisheries values.

b. Timber

This alternative schedules timber harvest in the most cost-efficient manner; however, constraints are imposed to ensure protection of big game thermal and hiding cover. In an effort to prevent potential mortality from mountain pine beetle, timber harvest in the early decades is concentrated in mature lodgepole pine stands.

With the West Pioneers included in Alternative Ha, the scheduled timber harvest in decade one is 23.8 MMBF per year. The long-term sustained yield capacity is 37.1 MMBF per year. Approximately 434 thousand acres, or 54 percent of the tentatively suitable timber lands on the Forest are assigned scheduled timber prescriptions.

If the West Pioneers are held in a custodial management prescription and not allowed to contribute to the timber program as in Alternative H, the scheduled timber harvest level in decade one is 20.6 MMBF per year. The long term sustained yield capacity is 33.3 MMBF per year. Approximately 379,000 acres, or 47 percent of the tentatively suitable timber lands are scheduled for timber production. The RPA objectives for the Forest would not be met.

These alternatives have the fifth and seventh lowest suitable land base of the alternatives considered. Other resource management objectives, such as roadless recreation opportunities and wildlife habitat maintenance, have removed potential acres from the land base.

c. Wilderness

These alternatives recommend wilderness classification for approximately 13 percent of the inventoried roadless lands in addition to the two existing classified wilderness areas. These wilderness recommendations comprise 163,800 acres or 8 percent of the Forest. This alternative generally reflects the RARE II wilderness recommendations with additional recommendations for wilderness classification for the Italian Peaks further planning area and nonwilderness recommendation for the Middle Mountain Tobacco Roots further planning area. The northern portion of the East Pioneers (a portion of area F-1008) has been deleted from recommendation for wilderness (although it was recommended in RARE II) due to the potential for development of a molybedum deposit. This alternative ranks third lowest in total acreage to be recommended for wilderness classification. However, this alternative retains the second highest acreage in nonwilderness, unroaded status. This ensures that unroaded recreation opportunities and wildlife habitat security are maintained.

d. Minerals

All lands except those covered by a formal withdrawal are available for mineral access. A relatively restricted level of access is available for exploration and development within special rcreation managment areas proposed in this alternative. Some of the areas recommended for wilderness classification have high or very high nonenergy mineral favorability, including portions of the East Pioneers, West Big Hole, and Storm Lake area. Energy mineral favorability is high in the Italian Peak area proposed for wilderness classification. Wildlife considerations may also impose scheduling constraints on exploration and development. New mineral leases and subsequent lease reissuance will undergo additional analysis as required by NEPA, tiering to this EIS through incorporation by reference the information presented in this EIS. Specieal stipulations are used whenever the leased area has surface resource values needing special protection to meet the alternative management objectives.

e. Elk Eabitat Potential

These alternatives provide sufficient acres of effective cover and winter forage to maintain reasonable potential summer populations of 12,200 elk on Forest lands. The reasonable population has been determined in conjunction with Montana Department of Fish, Wildlife, and Parks to be the population which will not result in conflicts with private landowners when the elk are on the winter range.

Elk effective cover is reduced from the existing 1,118,000 acres to 1,004,000 by the fifth decade in the alternative without the West Pioneers assigned to development, a decrease of 15 percent. With the West Pioneers out of custodial management, the elk effective cover is reduced to 974,000 acres, a decrease of 17 percent. The greater the amount of decrease, the less the amount of overall elk security available. There are 379,000 acres in the suitable timber base with a harvest total for the first five decades of 1,305 MMBF in the alternative with custodial management for the West Pioneers. This results in an intensity index of 34.4, representing the relationship of total five decade harvest to suitable acres. There are 434,000 acres in the suitable timber base with a harvest toal for the first five decades of 1,455 MMBF in the alternative with a portion of the West Pioneers in the suitable land base. This results in an index of 33.5. The magnitude of this index represents the potential of the timber harvest program to affect key elk habitat componenets. Alternative H and Ha with and without the West Pioneers being managed for timber, have impacts on elk security similar or slightly less than Alternative A.

With the West Pioneers in custodial management, elk hunter days are reduced from the existing annual level of 66,425 to 63,104 by the fifth decade, a decrease of five percent. If the West Pioneers are assigned a full range of management prescriptions, elk hunter days are reduced from the existing annual level of 66,425 to 61,111 by the fifth decade, a decrease of eight percent.

f. Fisheries

Alternative H with the West Pioneers in custodial status increases potential catchable stream trout populations from the existing level of 324,000 to 337,800 in decade 1 with slight decreases to 336,900 in decade 5. Alternative Ha with the West Pioneers assigned a range of management prescriptions, increases potential catchable stream trout populations from the existing level of 324,000 to 336,600 in decade 1 with slight decreases to 335,800 by decade 5. Increases occur over estimated potential existing populations in the first decade due to implementation of allotment management plans and managed grazing systems. These alternatives provide moderate levels of scheduled fisheries habitat improvement. Potential populations resulting from management activities are moderately high of the alternatives considered.

It is estimated that the Forest currently produces 157,350 adult fish which are available for recruitment to the downstream fisheries. This number increases by 4,595 in the first decade and 1,750 in the fifth decade. If the West Pioneers is assigned custodial management, the number of fish available for recruitment is 5,145 in the first decade, and 2,260 in the fifth decade.

g. Road System

Approximately 2,925 miles of additional roading are needed to complete the Forest transportation system if portions of the West Pioneers area is included in the suitable timber base (Alternative Ha), fifth lowest of the alternatives. This includes approximately 112 miles of arterial and collector roads, to be built with capital investment funding. The majority of the arterial and collector roads will be built in the first five decades. The remainder of the local roading system is scheduled to be completed in the first ten decades. Average annual road construction in the first decade is approximately 45 miles. The Forest will continue to acquire right-of-way access across other ownerships to provide access to Forest lands for resource development.

If the West Pioneers are assigned custodial management (Alternative H), approximately 2,448 miles of additional road is needed to complete the system. This includes approximately 90 miles of arterial and collector roads to be built with capital investment funding. Average annual road construction in the first decade is approximately 38 miles.

h. Economic Costs and Benefits

These alternatives attempt to respond to the issues and concerns raised by the wide array of people interested in management of the Forest. Many of these concerns relate to nonpriced benefits, therefore the PNV of these alternatives are fifth lowest of the alternatives. With the West Pioneers in custodial management, the PNV drops lower than if portions of the West Pioneers are included in the timber base, resulting in a PNV that is fourth lowest of the alternatives considered. Timber costs are moderate, but benefits are low relative to the other alternatives, in part due to the emphasis on harvest of lodgepole pine.

Alternative H was analyzed both with and without the constraint to force harvest of lodgepole pine in the first decades instead of more valuable mixed conifer stands. Timber benefits with the constraint are $144 million. Without the constraint, the timber benefits are $156 million. PNV with the constraint is $160 million. Without the constraint the PNV is $150 million.

i. Socioeconomic and Social Impacts

This alternative maintains a range and timber program that is responsive to the needs of local industry: the range program slightly increases, while the scheduled timber harvest remains near current levels. Land use patterns will change over time as areas currently roadless are developed and as areas recommended for wilderness are closed to motorized use. This alternative attempts to respond to the public wildlife resource issues by scheduling timber harvest in time and space to minimize adverse impacts.

8. Alternative H (departure)

The goal of this alternative is to duplicate the goals and objectives of alternative H while incorporating a departure timber harvest schedule. The major purpose of the departure is to accelerate harvest of mature lodgepole pine stands to minimize mortality from a highly probable mountain pine beetle epidemic. This level of accelerated harvest is not possible if nondeclining flow constraints are used.

a. Range

The objective of this alternative is to emphasize domestic livestock grazing where it is cost efficient to do so and where potential competition between livestock and big game utilization of forage can be minimized. In this departure alternative, the timber harvest schedule causes significant forage production fluctuations from decade to decade reflecting the amount of transitory forage produced through timber harvest activities. The forage available in decade one supports 199,000 AUM's per year with an increase to

202,000 AUM's per year in decade three. RPA objectives are met in decades one and two but not in decades three through five.

b. **Timber**

This alternative schedules timber harvest in the most cost-efficient manner possible within the constraints of Alternative H but with the opportunity to depart from nondeclining even flow. Harvest schedules were constrained to limit the amount of fluctuation between decades. This was designed to provide market, community, and workforce stability. The annual base sale schedule in MMBF is shown in Table II-3.

Table II-3. Departure Decade 1-15 Timber Outputs.

DECADE	HARVEST IN MMBF
1	31.6
2	38.1
3	35.6
4	28.8
5	31.6
6	23.0
7	14.4
8	14.4
9	21.8
10	36.2
11-15	33.9

* First decade outputs are based on planned activities. Other decade figures are projected based on continued implementation of the alternative.

The FORPLAN model was constrained to not allow any decade timber harvest beyond 150 percent nor below 50 percent of that scheduled in Alternative H. Departure from nondeclining flow occurs in the fourth decade with a downfall to 28.8 MMBF. The long-term sustained yield capacity is 40.2 MMBF. This long-term sustained yield capacity is 6.6 MMBF higher than for Alternative H with nondeclining flow constraints. The acres assigned timber management prescriptions remain the same as in Alternative H.

c. **Wilderness**

This alternative is the same as alternative H in that it recommends wilderness classification for approximately 13 percent of the inventoried roadless lands in addition to the two existing classified wilderness areas. This constitutes 163,800 acres or 8 percent of the Forest.

d. Minerals

All lands except those covered by a formal withdrawal are available for mineral access. Impacts are the same as those described for alternative H. New mineral leases and subsequent lease reissuance will undergo additional analysis as required by NEPA, tiering to this EIS through incorporation by reference the information presented in this EIS. Special stipulations are used whenever the leased area has surface resource values needing special protection to meet the alternative management objectives.

e. Elk Habitat Potential

This alternative provides sufficient acres of effective cover and winter forage to maintain a reasonable summer population potential of 12,200 elk on forest lands. The reasonable population has been determined in conjunction with Montana Department of Fish, Wildlife, and Parks to be the population which will not result in conflicts with private landowners when the elk are on the winter range.

Elk effective cover is reduced from the existing 1,180,000 acres to 965,000 by the fifth decade, a decrease of 18 percent. As overall elk securiy is decreased, the probability of more restrictive hunting regulations increases. The total timber harvest scheduled in the first five decades is 1,657 MMBF with a suitable timber base of 378,500 acres. This results in an intensity index of 43.9. This index indicates the relative potential of the timber harvest to adversely affect key elk habitat components. The departure has the most impacting coefficient for intensity of timber harvest due to the large amount of harvest scheduled in the first five decades. Decreases in effective cover would occur in a relatively small timber base and impacts would be large.

Elk hunter days are reduced in the departure from the existing annual level of 66,425 to 61,111 by the fifth decade, a decrease of eight percent.

f. Fisheries

Alternative H (departure) increases potential catchable stream trout populations from the existing level of 324,000 to 336,600 in decade 1 with decreases to 334,000 by decade 5. Increases occur in the first decade above estimated existing potential populations due to implementation of allotment management plans which protect riparian vegetation in grazing allotments where a fishery stream exists. The potential populations resulting from management activities are moderate of alternatives considered.

It is estimated that the Forest currently produces 157,350 adult fish which are available for recruitment to the downstream fisheries. This number increases by 4,600 in the first decade and 1,750 in the fifth decade.

g. Road System

Approximately 2,490 miles of additional roading is needed to complete the Forest transprotation system. Annual road construction in Decade 1 is 43.6 miles, approximately 6 miles more per year than Alternative H. The majority of arterial and collector roads are scheduled for construction in the first five decades, while the local road system should be completed by the end of the tenth decade. The Forest will continue a program of obtaining right-of-way access to Forest land across other ownerships. Right-of-way acquisition will normally occur in conjunction with planned timber harvest.

h. Economic Costs and Benefits

This alternative has a PNV of $172 million, $12 million more than Alternative H and an opportunity cost of $126 million. The PNV is moderate in the range of alternatives considered.

i. Socioeconomic and Social Impacts

This alternative maintains a range and timber program that is more responsive to the needs of local industry than historic management has been in the short term. However, increased harvest of smaller diameter lodgepole pine in the early decades followed by a decrease in total harvest in the fourth decade, could lead to some instability in the local timber industry. The land use patterns will change over time as areas currently roadless are developed and as areas recommended for wilderness are closed to motorized use. This alternative is less responsive to public issues relating to the wildlife resource. The acceleration of timber harvest in the early decades would preclude scheduling to provide for desirabe amounts of elk security cover within the timber base.

9. Alternative I

The goal of this alternative is to maximize present net value while recommending all the inventoried roadless areas on the Forest for wilderness classification. Few constraints are imposed on nonwilderness management to maximize opportunities to manage in a cost-efficient manner. This alternative was developed as a maximum wilderness benchmark, was considered implementable and was brought forward in the analysis as an alternative.

a. Range

The objective of this alternative is to emphasize wilderness recommendations and to allow domestic livestock grazing where suitable. Grazing is allowed in recommended wilderness where that use is presently occurring; however, no new allotment use would be permitted. Restrictions on livestock grazing outside the wildernesses would be minimal. The potential livestock forage available in decade 1 is 178,000 AUM's per year with slow increases to 189,000 AUM's per year by decade five. Increases result mostly from transitory forage created through timber harvest. RPA objectives are not met.

b. Timber

This alternative limits timber harvest to those lands already accessed for development. On the suitable lands, timber harvest is scheduled in the most cost-efficient manner possible with few constraints imposed that detract from that objective. Scheduled timber harvest in decade one is 28.2 MMBF. The long-term sustained yield capacity is 25.7 MMBF. Approximately 347,000 acres, or 43 percent of the tentatively suitable timber lands are scheduled for timber production. The RPA objectives for the Forest are met within 10 percent in the first decade only.

c. Wilderness

This alternative recommends wilderness classification for all inventoried roadless areas included in the September 1983 roadless area inventory. The total acreage of these areas combined with existing wilderness comprise approximately 1,415,600 acres or 66 percent of the Forest.

d. Minerals

All lands except those covered by a formal withdrawal are available for mineral access. Under this alternative a relatively restricted level of access affects mineral exploration and development because of the amount of additional wilderness recommended for classification. Many of the areas proposed for wilderness exhibit high or very high favorability for nonenergy and energy minerals. New mineral leases and subsequent lease reissuance will undergo additional analysis as required by NEPA, tiering to this EIS through incorporation by reference the information presented in this EIS. Special stipulations are used whenever the leased area has surface resource values needing special protection to meet the alternative management objectives.

e. Elk Habitat Potential

This alternative provides sufficient acres of effective cover and winter forage to maintain a reasonable summer population potential 12,200 elk on forest lands. The "reasonable" population has been determined in conjunction with Montana Department of Fish, Wildlife, and Parks to be the population of elk which will not cause conflicts with private land owners when the elk are utilizing the winter range.

Elk effective cover is reduced from the existing 1,180,000 acres to 1,038,000 by the fifth decade, a decrease of 12 percent. As overall elk securiy is decreased, the possibility of more restrictive hunting regulations increases. The total timber harvest scheduled in the first five decades is 1,410 MMBF with a suitable timber base of 347,000 acres. This results in an intensity index of 40.6. This index indicates the relative potential of the timber harvest to adversely affect key elk habitat components. Alternative I has a large effect on elk because timber harvest is concentrated in a relatively small timber base, decreasing the proportional amount of elk security cover in that base.

Elk hunter days are reduced in this alternative from the existing annual level of 66,425 to 63,768 by the fifth decade, a decrease of four percent.

f. Fisheries

Alternative I increases potential catchable stream trout populations from the existing level of 324,000 to 337,800 in decade 1 with slight decreases to 337,200 by decade 5. Increases occur over potential existing populations in the first decade due to implementation of allotment management plans. The potential populations resulting from management activities are the third highest in the array of alternatives considered.

It is estimated that the Forest currently produces 157,350 adult fish which are available for recruitment to the downstream fisheries. This number increases by 5,145 in the first decade and 3,330 in the fifth decade.

g. Road System

Approximately 2,225 miles of addition roading is needed to complete the Forest transportation system. This includes approximately 50 miles of arterial and collector roads, to be built with capital investment funding. The majority of the arterial and collector roads are scheduled for construction in the first five decades, while the local road system should be completed in the first ten decades. Average annual road construction in the first decade is approximately 33 miles. The Forest will continue a program of obtaining right-of-way access to Forest land across other ownerships. Right-of-way acquisition will normally occur in conjunction with planned timber harvest.

h. Economic Costs and Benefits

Although a substantial portion of the Forest is recommended for wilderness, the PNV is only the eighth lowest of the alternatives. This is largely because the nonwilderness acreage is managed with very few constraints limiting cost efficient management. Present value costs are second lowest of the alternatives. Timber harvest is relatively high with associated revenues. Timber harvest is mostly scheduled to occur in areas already developed, thus road costs are lower than for most other alternatives.

i. Socioeconomic and Social Impacts

This alternative would have significant impacts on recreation opportunities available on the Forest; motorized opportunities would be restricted to a very limited area that would be intensively managed. Opportunies for wilderness recreation would be maximized but demand would be exceeded many times over. Other resource values in nonwilderness areas would be impacted by the level of development scheduled. There would be very little variety in land management activities or in resource use opportunities as the Forest would either be classified wilderness or developed for timber production.

10. Alternative S and Sa

These alternatives were developed in the period between the Revised Draft and Final EIS. They are developed directly from alternatives H and Ha and are designed to respond to public comment, internal concerns and refinement of existing data. The extent of these changes warrants the treatment of these alternatives separately from H and Ha. Major changes from alternatives H and Ha to S and Sa are discussed in the specific resource sections below. A summary of the changes are as follows:

1. In response to public comment and to better coordinate with the wilderness proposals of the adjacent Targhee National Forest and Salmon District of the Bureau of Land Management, additional wilderness is proposed in the Italian Peaks.

2. The recreation management area within and adjacent to the West Pioneer Montana Wilderness Study Area has been expanded.

3. Additional recreation management areas are proposed in the Garfield Mountain area, the Snowcrest Mountains, the Tobacco Root Mountains, the Minneopa Lake area, and the area west of Morrison Lake.

4. The acreage assigned to management prescriptions which permit scheduled timber management activities has been reduced: Areas were reassigned primarily as a result of ground truthing of timber management suitability and in recongnition of other resource values where timber management activities would not be a compatible use.

5. Major acreages in the Gravelly planning unit are changed from a range emphasis to a range/wildlife emphasis. This change is not expected to affect range outputs but is designed to more fully recognize and manage for the wildlife resource in those areas.

6. Management emphasis in the north Bighole was changed to more adequately reflect summer range wildlife values. These changes involve a reduction in acres available for timber management.

7. The model has been constrained to schedule timber harvest on at least 5 percent of the area which requires cable harvest systems in the first decade and at least 10 percent of these lands each decade in succeeding decades. The constraint applies through decade five. This constraint is applied to even the harvest of these lands through the decades such that harvest scheduling of mature timber on these lands can be accomplished in planned time frames and to initiate the use of these harvest systems on the Forest.

8. Wildlife habitat protection measures have been strengthened. In an effort to model these added protections, regeneration harvest of mature sawtimber is limited to 10 percent of the existing acreage of mature sawtimber in any given decade.

The goal of these alternatives remain the same as Alternatives H and Ha, to maximize present net value while responding to the range of resource use demands and concerns of the public who utilize the Beaverhead National Forest land and resources. While the goals remain the same, the combination of differences described above have resulted in meeting those goals at somewhat different levels. Alternatives H and Ha have been retained to allow comparison of outputs resulting from the changes. These alternatives meet the demand for dispersed and developed recreation, and respond to concerns for wilderness designation in more popular roadless areas. These alternatives schedule early decade timber harvest activities in areas highly susceptible to mountain pine beetle infestations. Elk habitat security is maintained throughout the Forest.

The analysis needed to reach this goal was conducted twice with two different assumptions resulting in two alternatives displayed in this DEIS. The first assumption is that the nonwilderness recommendation of the Montana Wilderness Study DEIS for the West Pioneers is accepted by Congress. Alternative Sa incorporates this assumption and the West Pioneers are managed for a variety of nonwilderness uses, including roadless recreation (portions of a recreation management area of 161,332 acres) and timber (a suitable timber base of 23,000 acres). The second assumption is that the nonwilderness recommendation for the West Pioneers is not accepted by Congress or that a decision was not made at the time of Forest Plan implementation. Alternative S incorporates this assumption and the West Pioneers area is held in custodial management. If the nonwilderness recommendation holds, the proposed land uses displayed in alternative Sa will be implemented.

a. **Range**

The objectives of these alternatives is to emphasize domestic livestock grazing where it is cost efficient to do so and where potential competition with big game forage utilization can be minimized. The potential livestock forage available in decade one under alternative S is 190,000 AUM's per year with slow increases to 194,000 AUM's per year by decade five. The potential livestock forage available in decade one in Alternative SA is 189,000 AUM's per year. Alternative S maintains the level of AUMs currently allotted. Alternative Sa will require a slight reduction. RPA objectives are met in decade one in alternative S but not in alternative Sa. Neither alternative meets RPA targets in succeeding decades.

Some potential AUM's would continue to be generated from transitory range forage outputs. Improved management practices including implementation of rest rotation and deferred grazing systems will be needed to avoid continued impacts to riparian areas and fisheries values.

b. **Timber**

This alternative schedules timber harvest in the most cost-efficient manner; however, constraints are imposed to ensure protection of big game thermal and hiding cover. Constraints are also imposed to force some scheduling of timber harvest in areas requiring cable harvest systems in the first five decades.

With the West Pioneers included in Alternative Sa, the scheduled timber harvest in decade one is 18.1 MMBF per year. The long-term sustained yield capacity is 34.5 MMBF per year. Approximately 360 thousand acres, or 45 percent of the tentatively suitable timber lands on the Forest are assigned scheduled timber prescriptions.

If the West Pioneers are held in a custodial management prescription and not allowed to contribute to the timber program as in Alternative S, the scheduled timber harvest level in decade one is 17.3 MMBF per year. The long term sustained yield capacity is 32.1 MMBF per year. Approximately 338,000 acres, or 42 percent of the tentatively suitable timber lands are scheduled for timber production. The RPA objectives for the Forest would not be met.

These alternatives have the second and fourth lowest suitable land base of any of the alternatives considered. Other resource management objectives, such as roadless recreation opportunities and wildlife habitat maintenance, have removed potential acres from the land base.

c. Wilderness

These alternatives recommend wilderness classification for approximately 14 percent of the inventoried roadless lands in addition to the two existing classified wilderness areas. These wilderness recommendations comprise 169,400 acres or 8 percent of the Forest. This alternative generally reflects the RARE II wilderness recommendations with additional recommendations for wilderness classification for the Italian Peaks further planning area and nonwilderness recommendation for the Middle Mountain Tobacco Roots further planning area. The northern portion of the East Pioneers (a portion of area F-1008) has been deleted from recommendation for wilderness (although it was recommended in RARE II) due to the potential for development of a molybdenum deposit. This alternative ranks seventh lowest in total acreage to be recommended for wilderness classification. However, this alternative retains the highest acreage in nonwilderness, unroaded status. This ensures that unroaded recreation opportunities and wildlife habitat security are maintained.

d. Minerals

All lands except those covered by a formal withdrawal are available for mineral access. A relatively restricted level of access is available for exploration and development within recreation managment areas proposed in this alternaitve. Some of the areas recommended for wilderness classification have high or very high nonenergy mineral favorability, including portions of the East Pioneers, West Big Hole, and Storm Lake area. Energy mineral favorability is high in the Italian Peak area proposed for wilderness classification. Wildlife considerations may also impose scheduling constraints on exploration and development. New mineral leases and subsequent lease reissuance will undergo additional analysis as required by NEPA, tiering to this EIS through incorporation by reference the information presented in this EIS. Special stipulations are used whenever the leased area has surface resource values needing special protection to meet the alternative management objectives.

e. Elk Habitat Potential

These alternatives provide sufficient acres of effective cover and winter forage to maintain reasonable potential summer populations of 12,200 elk on Forest lands. The reasonable population has been determined in conjunction with Montana Department of Fish, Wildlife, and Parks to be the population which will not result in conflicts with private landowners when the elk are on the winter range.

Elk effective cover is reduced from the existing 1,180,000 acres to 1,040,000 by the fifth decade in the alternative without the West Pioneers assigned to development, a decrease of 12 percent. This alternative retains the highest level of elk effective cover of the alternatives considered. With the West Pioneers out of custodial management, the elk effective cover is reduced to 1,037,000 acres. The greater the amount of decrease, the less the amount of overall elk security available. There are 338,000 acres in the suitable timber base with a harvest total for the first five decades of 1,101 MMBF in the alternative with custodial management for the West Pioneers. This results in an intensity index of 32.6, representing the relationship of total five decade harvest to suitable acres. This is sixth best of the alternatives considered.. There are 360,000 acres in the suitable timber base with a harvest total for the first five decades of 1,163 MMBF in the alternative with a portion of the West Pioneers in the suitable land base. This results in an index of 32.3. The magnitude of this index represents the potential of the timber harvest program to affect key elk habitat componenets.

With the West Pioneers in custodial management, elk hunter days are reduced from the existing annual level of 66,425 to 63,900 by the fifth decade, a decrease of 4 percent. If the West Pioneers are assigned a full range of management prescriptions, elk hunter days are reduced from the existing annual level of 66,425 to 63,000 by the fifth decade, a decrease of 5 percent.

f. **Fisheries**

Alternative S with the West Pioneers in custodial status increases potential catchable stream trout populations from 337,900 in decade 1 to 341,100 in decade 5. Alternative Sa with the West Pioneers assigned a range of management prescriptions, increases potential catchable stream trout populations from 337,900 in decade 1 to 339,800 in decade 5. Increases occur over estimated potential existing populations in the first decade due to implementation of allotment management plans and rest rotation and deferred grazing systems. These alternatives provide moderate levels of scheduled fisheries habitat improvement. Potential populations resulting from management activities are highest of the alternatives considered.

It is estimated that the Forest currently produces 157,350 adult fish which are available for recruitment to the downstream fisheries. This number increases by 5,190 for each of the first five decades for both Alternatives S and Sa.

g. **Road System**

Approximately 2,302 miles of additional roading are needed to complete the Forest transportation system if portions of the West Pioneers area is included in the suitable timber base (Alternative Sa). This includes approximately 90 miles of arterial and collector roads, to be built with capital investment funding. The majority of the arterial and collector roads will be built in the first five decades. The remainder of the local roading system is scheduled to be completed in the first ten decades. Average annual road construction in the first decade is approximately 36 miles. The Forest will continue to acquire right-of-way access across other ownerships to provide access to Forest lands for resource development.

If the West Pioneers are assigned custodial management (Alternative S), approximately 2,143 miles of additional road is needed to complete the system. This is the second least number of roads required of the alternatives considered. This includes approximately 90 miles of arterial and collector roads to be built with capital investment funding. Average annual road construction in the first decade is approximately 34 miles.

h. Economic Costs and Benefits

These alternatives attempt to respond to the issues and concerns raised by the wide array of people interested in management of the Forest. Many of these concerns relate to nonpriced benefits, therefore the PNV of this alternative is third lowest of the alternatives. With the West Pioneers in custodial management, the PNV drops lower than if portions of the West Pioneers are included in the timber base, resulting in a PNV that is second lowest of the alternatives considered. Timber costs are low and benefits are low relative to the other alternatives, in part due to the emphasis on harvest of lodgepole pine.

i. Socioeconomic and Social Impacts

This alternative maintains a range program at or near existing levels. The allowable timber sale quantity is less than current harvest levels. This may cause some supply problems for local forest industries in the future as existing alternate sources of timber decline, and if the current level of industry competition remains at current levels. Land use patterns will change over time as areas currently roadless are developed and as areas recommended for wilderness are closed to motorized use. This alternative attempts to respond to the public wildlife resource issues by scheduling timber harvest in time and space to minimize adverse impacts.

11. Alternative W

The goal of this alternative is to maximize present net value while emphasizing wildlife habitat protection and enhancement. Wilderness recommendations are scheduled for inventoried roadless areas which have recieved substantial support for designation from environmental groups. This alternative also provides for timber harvest and livestock forage utilization where suitable.

a. Range

The objective of this alternative is to emphasize domestic livestock grazing where it is cost efficient to do so and where other resource values will not be adversely affected. The amount of potential livestock forage available in the first decade is 195,000 AUM's per year with slow increases to 203,000 AUM's per year in decade five. The majority of the increase results from transitory forage created through timber harvest. RPA objectives are met in decade one only.

b. Timber

This alternative schedules timber harvest in the most cost-efficient manner but with constraints designed to provide desirable amounts of big game security cover. The timber harvest scheduled for decade one is 37.6 MMBF. The long-term sustained yield capacity is 35.7 MMBF. Approximately 616,000 acres, or 76 percent of the tentatively suitable timber lands are scheduled for timber production. This is the second largest acreage of the alternatives considered. The RPA objectives for the Forest are met within 10 percent for the first three decades.

c. Wilderness

This alternative recommends wilderness classification for approximately 25 percent of the inventoried roadless lands in addition to the two existing classified wilderness areas. The inventoried roadless areas included here are those identified in the "Alternative W" proposal, including the North Big Hole, West Big Hole, East Pioneers, Middle Mountain Tobacco Root, and Italian Peak areas. Wilderness recommendations comprise 315,300 acres or 15 percent of the Forest.

d. Minerals

All lands except those covered by a formal withdrawal are available for mineral access. Many of the areas proposed for wilderness contain high or very high potential for energy or nonenergy mineral resources. New mineral leases and subsequent lease reissuance will undergo additional analysis as required by NEPA, tiering to this EIS through incorporation by reference the information presented in this EIS. Special stipulations are used whenever the leased area has surface resource values needing special protection to meet the alternative management objectives.

e. Elk Habitat Potential

This alternative provides sufficient acres of effective cover and winter forage to maintain a reasonable summer population potential of 12,200 elk on forest lands. The "reasonable" population has been determined in conjunction with Montana Department of Fish, Wildlife, and Parks to be the population of elk which will not cause conflicts with private land owners, when the elk are on the winter range.

Elk effective cover is reduced from the existing 1,180,000 acres to 983,000 by the fifth decade, a decrease of 17 percent. As overall elk securiy is decreased, the possibility of more restrictive hunting regulations increases. The total timber harvest scheduled in the first five decades is 1,880 MMBF with a suitable timber base of 616,000 acres. This results in an intensity index of 30.5. This coefficient indicates the relative potential of the timber harvest to adversely affect key elk habitat components. Alternative W is second only to alternative D for least impacting harvest intensity. The decrease in effective cover has only a moderate effect of elk security.

Elk hunter days are reduced in this alternative from the existing annual level of 66,425 to 62,440 by the fifth decade, a decrease of six percent.

f. Fisheries

Alternative W increases potential catchable stream trout populations from the existing level of 324,000 to 334,000 in decade 1 with slight decreases to 330,700 by decade 5. Increase occur over potential existing populations in the first decade due to implementation of allotment management plans. The potential populations resulting from management activities are moderate in the array of alternatives considered.

It is estimated that the Forest currently produces 157,350 adult fish which are available for recruitment to the downstream fisheries. This number increases by 3,330 in the first decade and 140 in the fifth decade.

g. Road System

Approximately 4,154 miles of additional roading is needed to complete the Forest transportation system. This includes approximately 106 miles of arterial and collector roads, to be built with capital investment funding. The majority of the arterial and collector roads are scheduled for construction in the first five decades, while the local road system should be completed in the first ten decades. Average annual road construction in the first decade is approximately 61 miles. The Forest will continue a program of obtaining right-of-way access to Forest land across other ownerships. Right-of-way acquisition will normally occur in conjunction with planned timber harvest.

h. Economic Costs and Benefits

This alternative has the third highest PNV ($207 million) of the alternatives, largely due to the relatively large timber harvest program. Road miles and costs are the second highest of the alternatives. Road miles and costs per unit of timber harvest are high due to the need to distribute harvest throughout the suitable land base to minimize wildlife impacts.

i. Socioeconomic and Social Impacts

This alternative is very similiar to alternative F in the nonwilderness program. The range and timber program is large enough to not adversely affect the local industries, yet there is also an effort made to provide appropriate wildlife habitat. The wilderness designations proposed in this alternative have received strong national and state-wide support, and are said by the wilderness advocates to be the "bottom-line" for the Beaverhead National Forest. Still, there are opponents to classification of these areas, with particular controversy focused on the West Big Hole and North Big Hole.

D. Comparison of Alternatives

The discussion in this section focuses on how major resource outputs and economic effects vary among alternatives. The purpose is to show how the alternatives considered compare in maximizing net public benefits. A comparison of how each alternative compares to current direction is displayed in Figures II-2 through II-12. A summary of how each issue is affected by alternatives is in Table II-4. Total outputs for each alternative and selected benchmarks are shown in Table II-20 and outputs that vary significantly among alternatives are discussed.

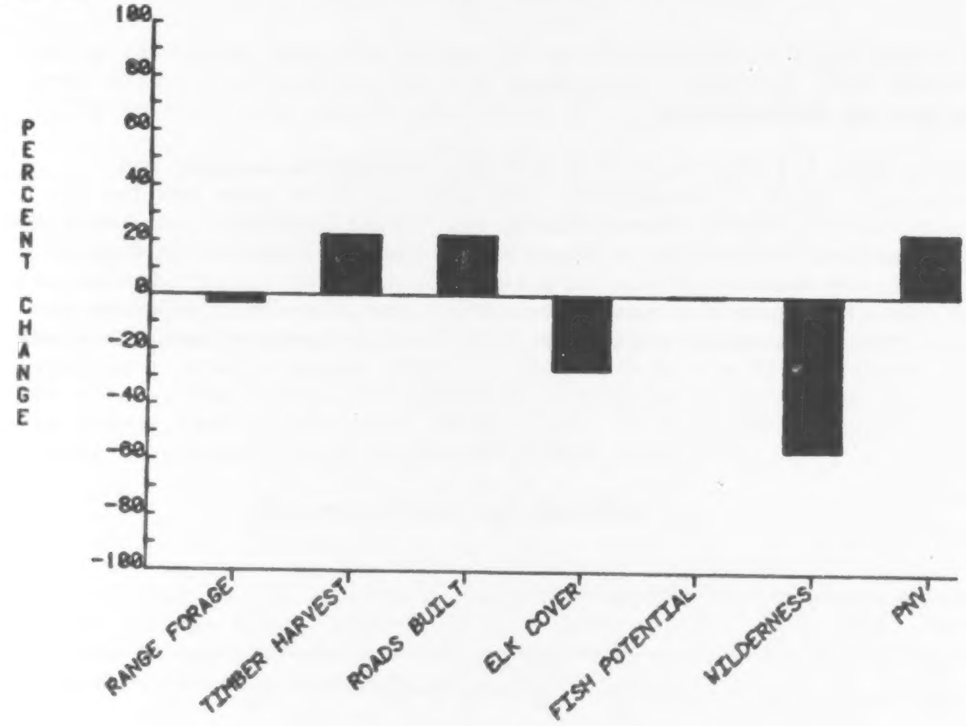
Table II-4

Present Net Value and Indicators for the Issues Addressed by the Alternatives

	Unit of	Alternatives											
	Measure	A	B	C	D	F	G	H	Hdept	I	S	Sa	W
Present Net Value	MM$	196	244	170	136	200	249	157	172	180	140	143	207
Domestic Livestock Grazing decade I	M AUM's	190	184	182	186	192	185	192	199	178	190	189	195
Base Timber Sale Schedule-decade I	MMBF	29.4	33.8	25.8	18.8	36.2	43.6	20.6	31.6	28.2	17.3	18.1	37.6
	MMCF	8.9	10.9	8.9	5.7	11.3	13.2	7.1	11.3	8.3	5.8	6.1	11.4
Long term sustained yield	MMBF	31.3	49.2	42.3	18.6	35.3	41.2	33.3	40.2	25.7	32.1	34.5	35.7
	MMCF	10.8	16.4	14.1	6.0	11.4	13.3	10.5	13.4	8.3	9.3	9.8	11.5
Suitable timberland	acres	535.3	652.5	537.2	313.1	609.3	547.6	378.5	378.5	347.1	338.3	360.3	615.8
Recreation management Roadless areas (nonwilderness)	M acres	1000.4	1044.9	280.7	670.0	656.4	1051.3	1115.8	1115.8	173.5	1136.4	1114.4	784.0
Wildlife habitat Elk effective cover decade I	M acres	1114	1099	1118	1140	1098	1105	1128	1111	1136	1140	1139	1097
decade V	M acres	973	887	921	1078	982	971	1005	965	1038	1040	1037	983
Fisheries Potential decade I	M fish	334.0	334.8	334.4	337.1	334.0	335.1	337.8	336.6	336.6	337.9	337.9	334.0
decade V	M fish	326.53	331.5	326.6	335.6	330.7	329.3	336.9	335.8	334.0	334.1	339.8	330.7
Road construction Additional miles needed for management	miles	3550	4324	3570	1965	4103	3550	2452	2490	2225	2143	2302	4154
Roads constructed decade I	miles/yr	52.4	63.5	53.3	29.7	60.6	53.3	37.8	43.6	33.2	33.8	35.9	61.0
decade V	miles/yr	36.5	44.6	36.7	20.1	42.3	36.4	25.0	29.3	22.8	21.7	23.4	42.9
Wilderness	acres	337.7	173.5	1107.2	945.9	620.2	235.5	337.3	327.3	1415.6	342.9	342.9	488.8

COMPARISON OF ALTERNATIVE B TO ALTERNATIVE A (CURRENT DIRECTION)
CHANGE IN DECADE 1 OUTPUTS

Figure II-2



COMPARISON OF ALTERNATIVE C TO ALTERNATIVE A (CURRENT DIRECTION)
CHANGE IN DECADE 1 OUTPUTS

Figure II-3

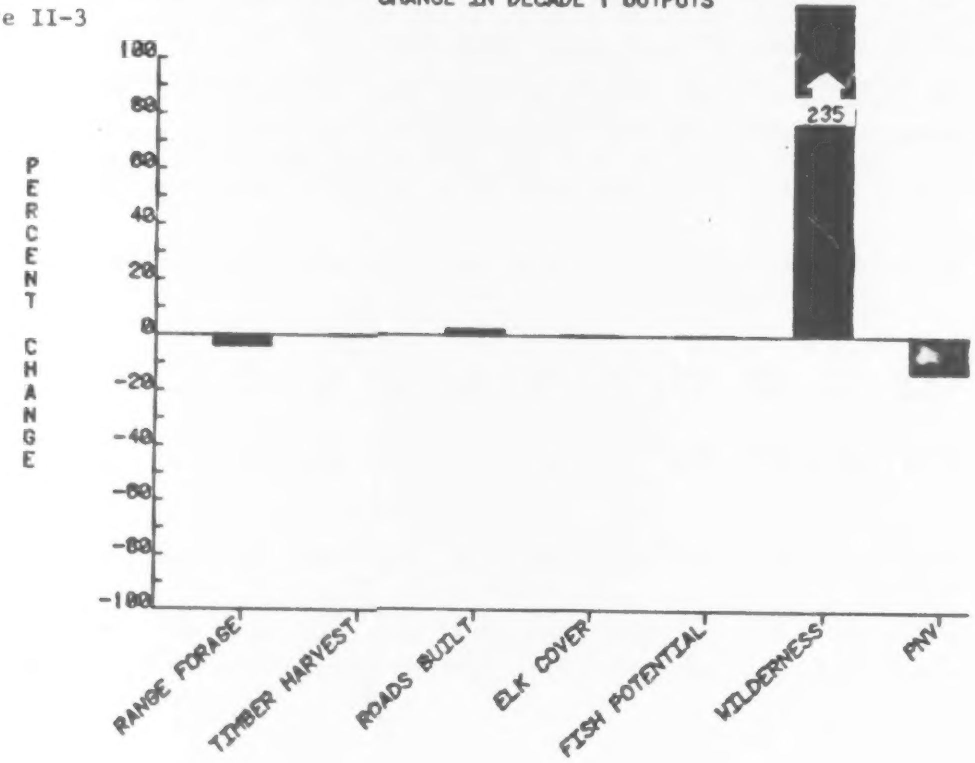


Figure II-4

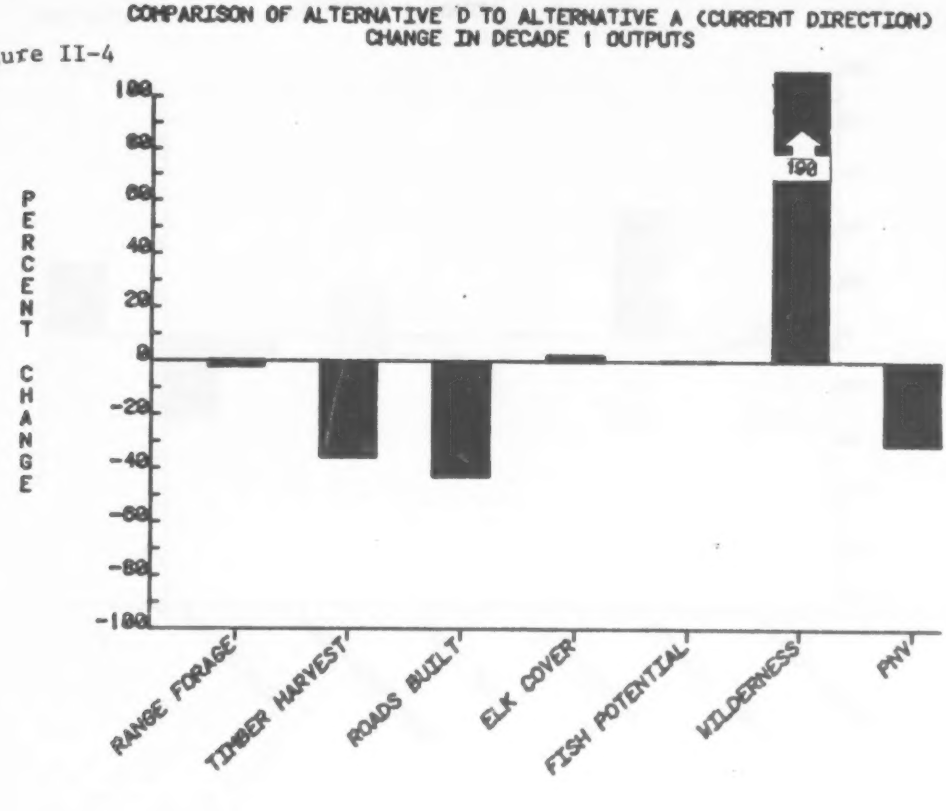
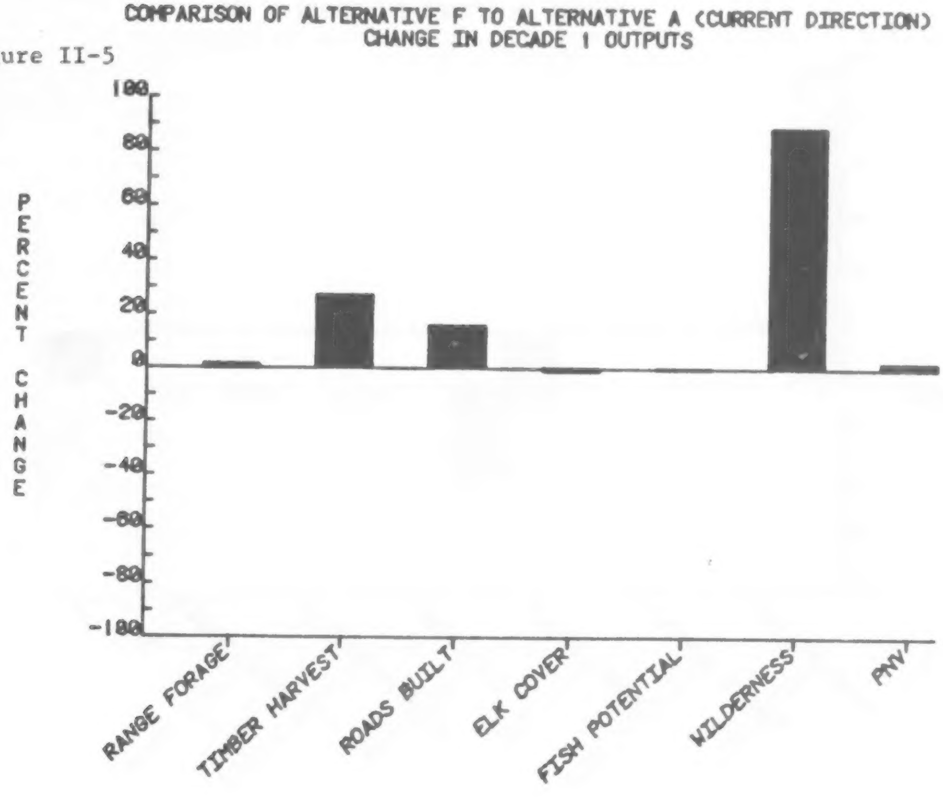
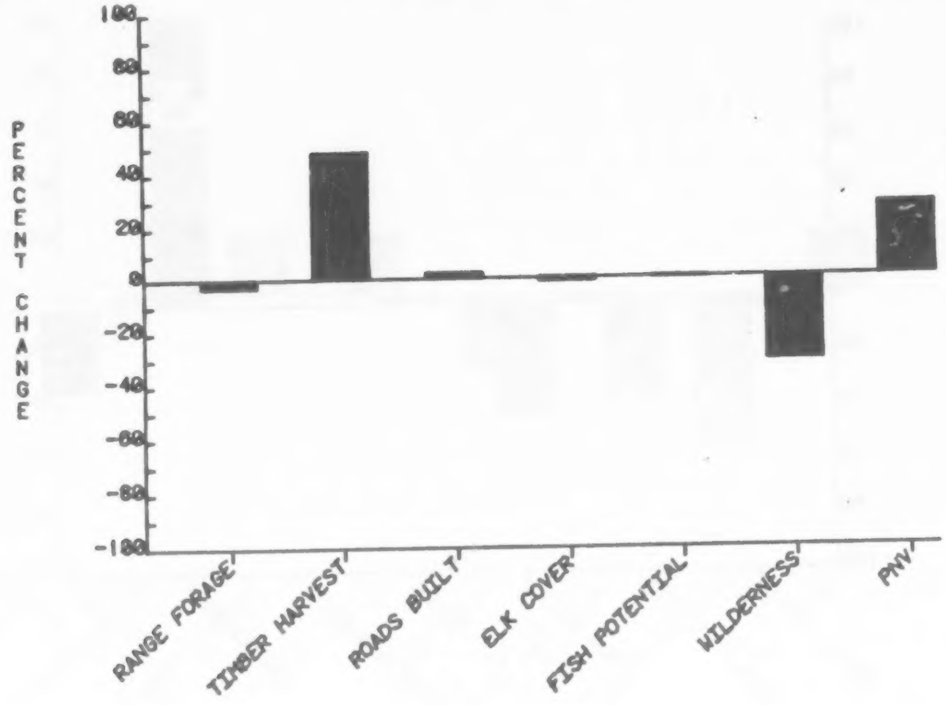


Figure II-5



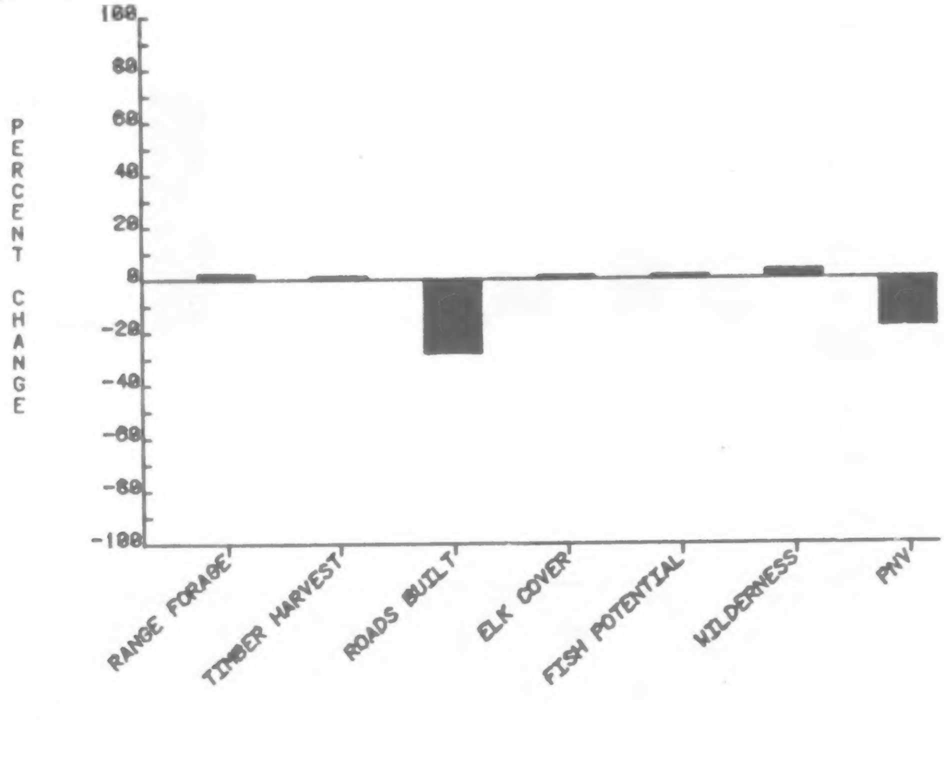
COMPARISON OF ALTERNATIVE G TO ALTERNATIVE A (CURRENT DIRECTION)
CHANGE IN DECADE 1 OUTPUTS

Figure II-6



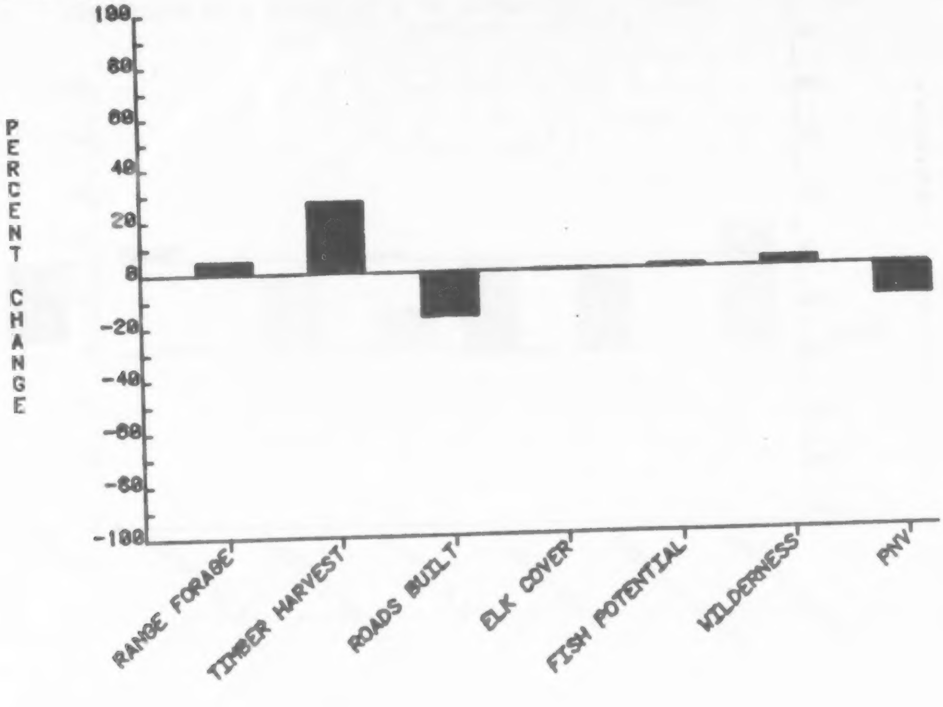
COMPARISON OF ALTERNATIVE H TO ALTERNATIVE A (CURRENT DIRECTION)
CHANGE IN DECADE 1 OUTPUTS

Figure II-7



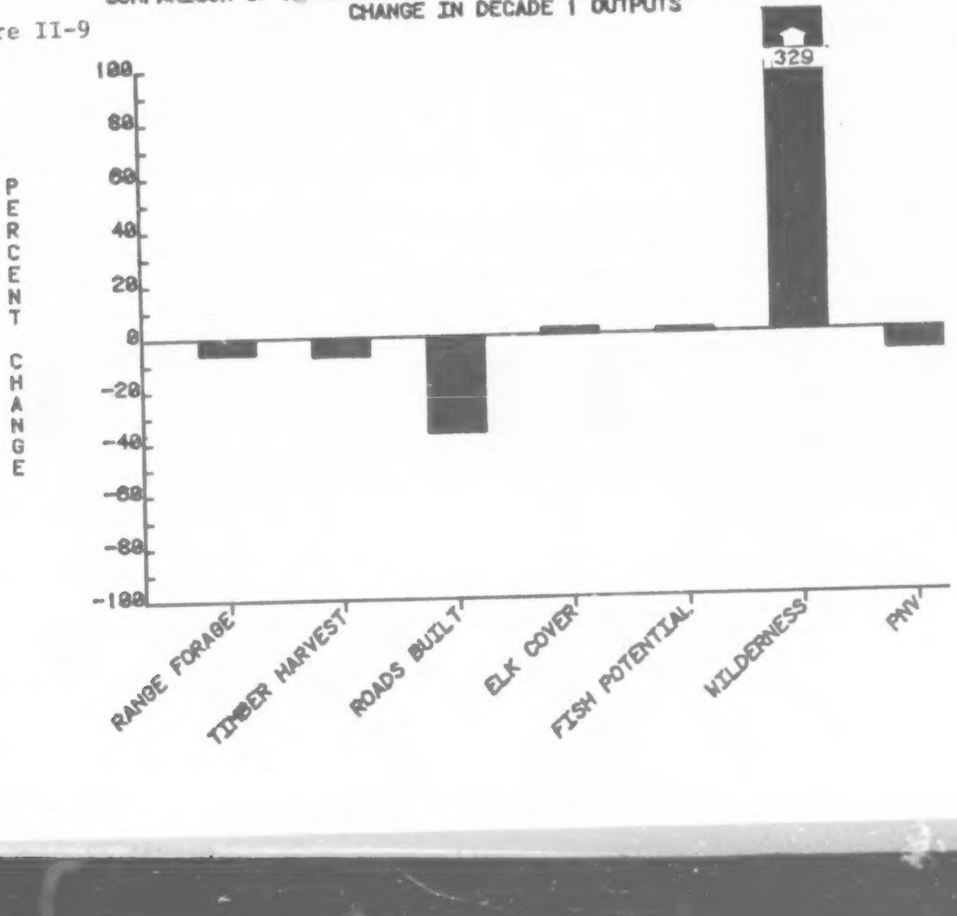
COMPARISON OF ALTERNATIVE HA (DEPT) TO ALTERNATIVE A (CURRENT DIRECTION)
CHANGE IN DECADE 1 OUTPUTS

Figure II-8



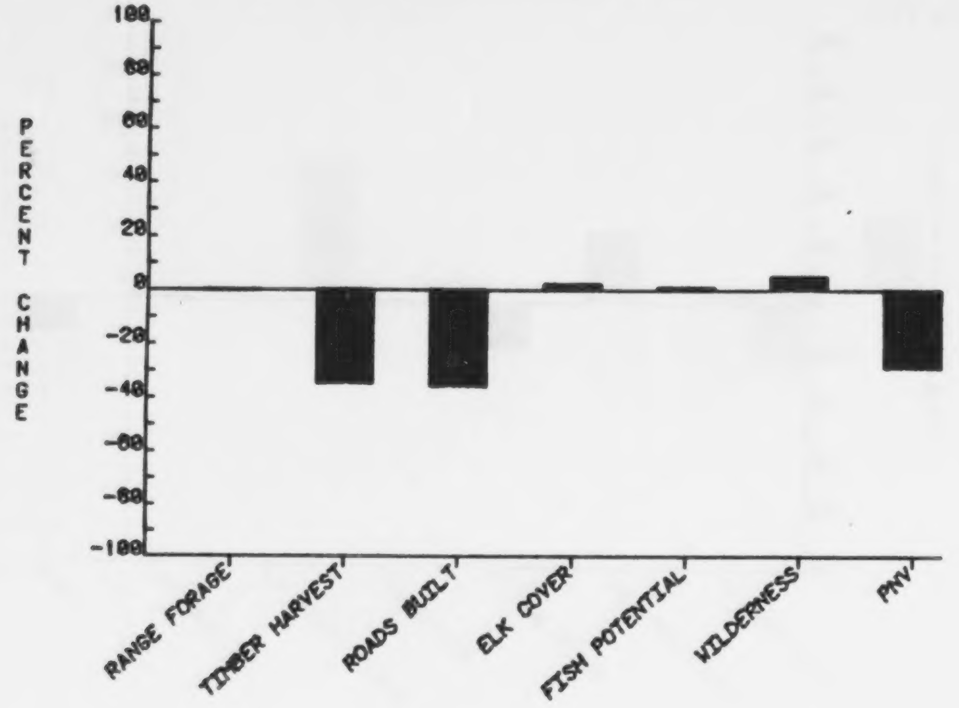
COMPARISON OF ALTERNATIVE I TO ALTERNATIVE A (CURRENT DIRECTION)
CHANGE IN DECADE 1 OUTPUTS

Figure II-9



COMPARISON OF ALTERNATIVE S (PA) TO ALTERNATIVE A (CURRENT DIRECTION)
CHANGE IN DECADE 1 OUTPUTS

Figure II-10



COMPARISON OF ALTERNATIVE SA TO ALTERNATIVE A (CURRENT DIRECTION)
CHANGE IN DECADE 1 OUTPUTS

Figure II-11

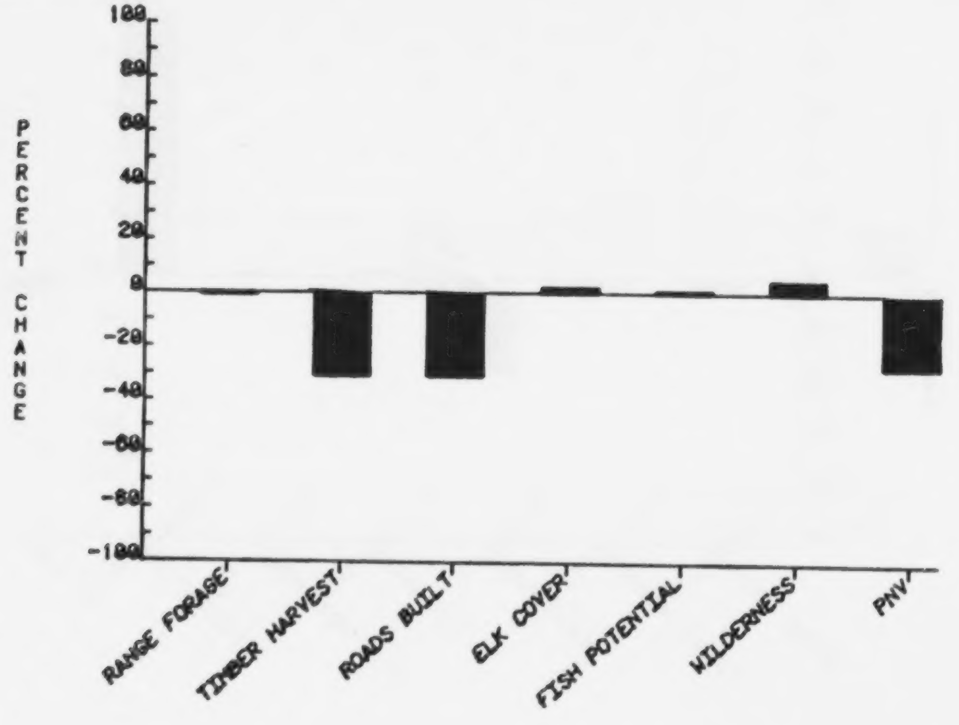
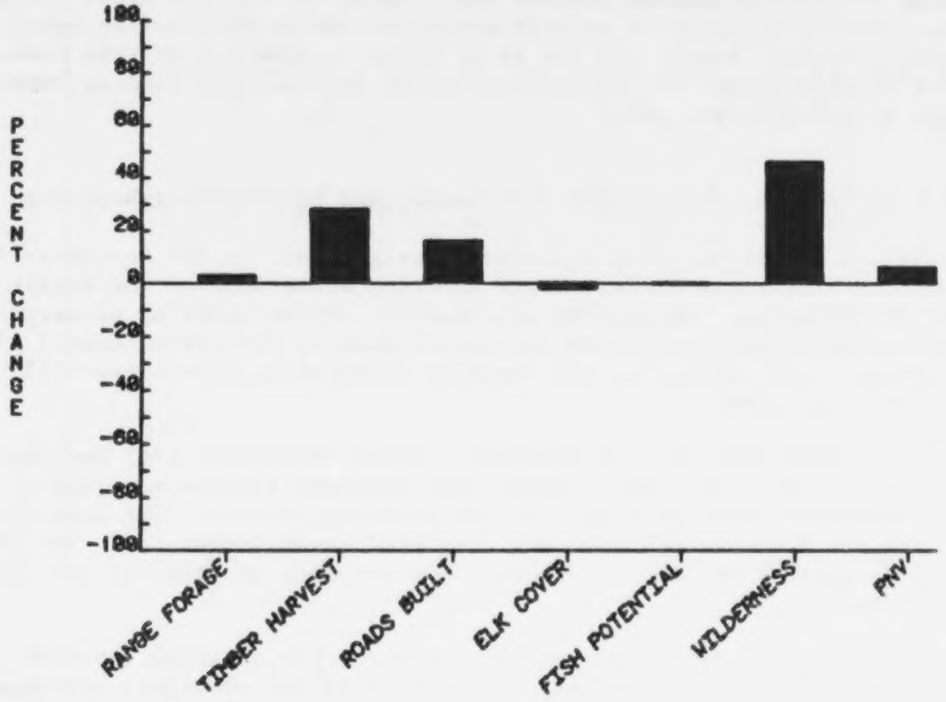


Figure II-12



COMPARISON OF ALTERNATIVE W TO ALTERNATIVE A (CURRENT DIRECTION)
CHANGE IN DECADE 1 OUTPUTS

1. **Recreation**

a. **Dispersed Recreation**

Dispersed recreation outside wilderness occurs in primitive and semiprimitive motorized and nonmotorized settings. All alternatives will supply opportunity for dispersed recreation outside wilderness in excess of the expected use for at least the next five decades. However, the specific areas of the Forest will provide different types of dispersed recreation opportunities as development of other resources such as timber management occurs. Alternatives which plan for larger amounts of development will continue to meet the overall demand for dispersed recreation; however, larger areas will change from providing nonmotorized to motorized settings, conversely, alternatives which propose lesser amounts of development will retain more area available for nonmotorized recreational opportunities.

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b. Developed Recreation

The developed sites have an existing capacity of 2,260 persons at one time, representing 494,000 recreation visitor days (based on 1980 RIM data) throughout one season. Developed capacity exceeds projected demand Forest-wide under all alternatives; however, some sites are at or above optimum use at this time. Investments in maintenence and rehabilitation to full service funding levels may be required to mitigate overuse.

2. Wilderness, Recommended Wilderness, and the Roadless Resource

All alternatives retain existing wilderness designations in the Anaconda-Pintler and Lee Metcalf Wilderness Areas. Total existing wilderness on the Forest comprises 173,500 acres. Recreation use capacity of the existing wilderness is deemed sufficient to meet projected recreation demands for approximately five decades; however, the recreation use capacity of existing wilderness will be exceeded after that time.

National Forest Management Act regulations (revised September 1982 and amended September 1983) require that each Forest inventory and analyze management options for roadless lands as a part of the planning process. The Roadless Area inventory for the Beaverhead Forest was completed in September 1983, and the analysis of management options for these lands has been an integral part of this planning process.

The Beaverhead Forest inventoried roadless resource (as of 1983) reported in this EIS includes 34 areas (displayed in Table II-5) and comprises approximately 1,246,000 acres. These lands include all areas that were inventoried as roadless in the 1977 RARE II effort with the following exceptions: 1) lands that are classified wilderness or have been released from consideration by the Lee Metcalf Wilderness Act; 2) lands designated in the West Pioneer Mountains for wilderness evaluation through the Montana Wilderness Study Act; and 3) lands that no longer meet the established roadless area criteria because of management activities that have occurred since 1979. The third category of exceptions includes approximately 115,183 acres, and is portrayed in Table II-6.

In accordance with national direction, roadless acres in the West Pioneer MWSA area will remain in the Forest's overall inventory of roadless lands, but are not included in the inventoried roadless areas that are being considered for wilderness designation in this EIS. Additionally, lands released by the Lee Metcalf Wilderness Act are not being considered for wilderness in this planning process. More information on the inventoried roadless areas is located in Chapter III and Appendix C.

Table II-5

Wilderness Recommendations by Inventoried Roadless Area by Alternative
(Acres)

Roadless Area		Alternative A CD*	B	C	D	F	G	H	I	W	S PA**
North Big Hole											
Beaverhead NF portion											
	1-001A	0	0	715	715	715	0	0	715	0	0
	1-001B	0	0	3217	3217	0	0	0	3217	0	0
	1-001C	0	0	14,372	14,372	0	0	0	14,372	0	0
	A1-001	0	0	24,332	24,332	24,332	0	0	24,332	24,332	0
	B1-001	6571	0	6571	6571	6571	6571	6571	6571	6571	6571
	C1-001	0	0	0	0	0	0	0	1,521	0	0
	D1-001	0	0	0	0	0	0	0	2,370	0	0
Bitterroot NF portion		0	0	0	3139	0	0	0	3628	0	0
Total		6571	0	49,207	52,346	31,618	6571	6571	56,726	30,903	6571
Beaver Lake	(1-003)										
	1-003A	0	0	0	0	0	0	0	7926	0	0
	1-003B	0	0	0	0	0	0	0	5548	0	0
Total		0	0	0	0	0	0	0	13,474	0	0
Saginaw Cr	(1-004)	0	0	0	0	0	0	0	8493	0	0
Tash Peak	(1-005)	0	0	0	0	0	0	0	62,119	0	0
West Pioneers											
	1-006A	0	0	0	0	0	0	0	12,806	0	0
	1-006B	0	0	0	0	0	0	0	25,064	0	0
	1-006C	0	0	0	0	0	0	0	11,982	0	0
	1-006D	0	0	0	0	0	0	0	10,702	0	0
	1-006E	0	0	0	0	0	0	0	11,765	0	0
	1-006F	0	0	0	0	0	0	0	18,213	0	0
Total		0	0	0	0	0	0	0	90,532	0	0
East Pioneers											
	A1-008	61,295	0	61,295	61,295	61,295	0	61,295	61,295	61,295	61,295
	B1-008	7007	0	7007	7007	0	0	7007	7007	7007	7007
	C1-008	6130	0	6130	6130	0	0	6130	6130	6130	6130
	D1-008	3708	0	3708	3708	0	0	3708	3708	3708	3708
	E1-008	1415	0	1415	1415	0	0	1415	1415	1415	1415
	F1-008	10,088	0	10,088	10,088	10,088	0	0	10,088	10,088	0
	1-008A	0	0	0	0	0	0	0	3649	0	0
	1-008B	0	0	41,778	0	0	0	0	41,778	0	0
	1-008D	0	0	9473	9473	0	0	0	9473	0	0
Total		89,643	0	140,894	99,116	71,383	0	79,555	144,543	89,643	79,555
Call Mountain	(1-009)	0	0	0	0	0	0	0	10,179	0	0
Cattle Gulch	(1-010)	0	0	0	0	0	0	0	18,891	0	0

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* CD is the Current Direction Alternative.
** PA is the Proposed Action Alternative.

Table II-5 (continued)

Roadless Area	A	B	C	D	F	G	H	I	W	S
Alternative										
Fleecer (1-011)										
Beaverhead NF portion	0	0	0	0	0	0	0	15,853	0	0
Deerlodge NF portion	0	0	0	0	0	0	0	21,355	0	0
Total	0	0	0	0	0	0	0	37,208	0	0
Granulated Mountain (1-012)	0	0	0	0	0	0	0	14,960	0	0
Middle Mtn. Tobacco Root										
Beaverhead NF portion										
1-013	0	0	721	721	721	0	0	721	721	0
A1-013	0	0	5353	5353	0	0	0	5353	5353	0
B1-013	*	0	1710	1710	1710	0	0	1710	1710	0
C1-013	0	0	10,388	10,388	0	0	0	10,388	0	0
D1-013	0	0	3665	3665	0	0	0	3665	3665	0
E1-013	0	0	6018	6018	0	0	0	6018	6018	0
F1-013	0	0	22,801	22,801	22,801	0	0	22,801	22,801	0
G1-013	0	0	7680	7680	0	0	0	7680	7680	0
Deerlodge NF portion	0	0	34,991	34,991	34,991	0	0	34,991	34,991	0
Total	*	0	93,327	93,327	60,223	0	0	93,327	82,939	0
Potosi (1-014)	0	0	0	0	0	0	0	5465	0	0
Bear Creek (1-015)	0	0	8252	0	0	0	0	8252	0	0
McKenzie Canyon (1-016)	0	0	33,652	0	0	0	0	33,652	0	0
Sourdough Mountain (1-017)	0	0	14,838	0	0	0	0	14,838	0	0
Timber Butte (1-018)	0	0	5018	0	0	0	0	5018	0	0
Dixon Mountain (1-019)	0	0	3982	0	0	0	0	3982	0	0
Four Eyes Canyon (1-020)	0	0	8237	8237	8237	0	0	8237	0	0
Sheep Mountain (1-021)	0	0	32,115	0	0	0	0	32,115	0	0
Crockett Lake (1-022)	0	0	6830	0	0	0	0	6830	0	0
Cherry Lakes (1-023)	0	0	12,940	0	0	0	0	12,940	0	0
Vigilante (1-024)	0	0	16,458	0	0	0	0	16,458	0	0
Snowcrest Mountain (1-025)										
1-025A	0	0	39,021	39,021	39,021	0	0	39,021	0	0
1-025B	0	0	58,609	58,609	58,609	0	0	58,609	0	0
Total	0	0	97,630	97,630	97,630	0	0	97,630	0	0

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* Roadless Area B1-013 is designated as Further Planning in Alternative A; therefore the acres are not reflected in the wilderness total.

	Alternative									
	A	B	C	D	F	G	H	I	W	S
Roadless Area										
Black Butte (1-026)	0	0	39,787	0	0	0	0	39,787	0	0
Big Horn Mountain (1-027)	0	0	50,390	50,390	0	0	0	50,390	0	0
Lone Mountain (1-028)	0	0	14,138	0	0	0	0	14,138	0	0
Freezeout Mountain (1-029)										
1-029A	0	0	65,794	65,794	0	0	0	65,794	0	0
1-029B	0	0	29,304	0	0	0	0	29,304	0	0
Total	0	0	95,098	65,794	0	0	0	95,098	0	0
Storm Lake (1-427)										
Beaverhead NF portion	1808	0	1808	1808	1808	1808	1808	1808	1808	1729
Deerlodge NF portion	4114	0	4114	4114	4114	0	4114	5673	4114	4114
Total	5922	0	5922	5922	5922	1808	5922	7481	5922	5843
Anderson Mountain (1-942)										
Beaverhead NF portion	0	0	0	0	0	0	0	30,331	0	0
Salmon NF portion	0	0	15,919	15,919	0	0	0	18,120	0	0
Total	0	0	15,919	15,919	0	0	0	48,451	0	0
West Big Hole (1-943)										
Beaverhead NF portion										
1-943A	0	0	0	0	0	0	0	6626	6626	0
1-943B	0	0	0	13,760	13,760	0	0	13,760	0	0
A1-943	0	0	0	0	0	0	0	17,401	17,401	0
B1-943	0	0	31,707	31,707	31,707	0	0	31,707	31,707	0
C1-943	0	0	6202	6202	6202	0	0	6202	6202	0
I1-943	55,087	0	55,087	55,087	55,087	0	55,087	55,087	55,087	55,087
Salmon NF portion	0	0	73,213	46,036	52,515	45,386	0	81,068	47,052	0
Total	55,087	0	166,209	152,792	159,271	45,386	55,087	211,851	164,075	55,087
Goat Mountain (1-944)										
Beaverhead NF portion	0	0	9454	0	0	0	0	9454	0	0
Salmon NF portion	0	0	35,488	0	0	10,706	0	35,488	0	0
Total	0	0	44,942	0	0	10,706	0	44,942	0	0
Beaverhead NF Portion										
Maiden Peak 1-945	0	0	50,116	50,116	0	0	0	50,116	2140	0
Eighteenmile Peak A1-945	0	0	27,815	27,815	27,815	27,815	0	27,815	9742	11,605
Italian Peak I1-945	*	0	12,986	12,986	12,986	12,986	12,986	12,986	12,986	12,986
Salmon NF portion	0	0	50,181	0	0	0	0	50,181	0	0
Targhee NF portion	42,500	0	142,300	42,500	142,300	0	42,500	146,300	0	42,500
Total	42,500*	0	283,398	133,417	183,101	40,801	55,486	287,398	24,868	67,091**

* Roadless I1-945 is designated as Further Planning in Alternative A; therefore the acres are not reflected in the wilderness total.

** On the Beaverhead portion of the Eighteenmile/Italian Peaks Roadless Area, the Italian Peaks Wilderness recommendation has been expanded to 25,664 acres in the Proposed Action Alternative; 1073 acres of which was not inventoried roadless because its area did not meet the 5000 acre roadless area requirement.

Table II-5 (cont.)

	Alternative									
	A	B	C	D	F	G	H	I	W	S
Garfield Mountain (1-961)										
Beaverhead NF portion	0	0	42,701	42,701	42,701	0	0	42,701	0	0
Targhee NF portion	0	0	0	0	0	0	0	47,500	0	0
Total	0	0	42,701	42,701	42,701	0	0	90,201	0	0
Mt. Jefferson (1-962)										
Beaverhead NF portion	*	0	*	*	*	*	*	4474	*	*
Targhee NF portion	0	0	0	0	0	0	0	60,000	0	0
Total	0*	0	0*	0*	0*	0*	0*	64,474	0*	0*

* Roadless Area 1-962 (Mt. Jefferson) is contiguous to a larger roadless area administered by the BLM. Designation in all alternatives except A, I and B is deferred pending a decision on the remainder of the area. In Alternative A, the area is designated as Further Planning. In Alternatives A, C, D, F, G, H, W and S, the acres are not reflected in the wilderness total.

Table II-6 Inventoried Roadless Area Adjustments, 1979-1982

Beaverhead National Forest

Inventoried Roadless Area	1977 Inventory						
	Gross Acres	Net Acres	Gross Change	Net Change	Reason	Revised Gross	Revised Net
North Big Hole (1-001)							
Beaverhead National Forest:	38,300	37,810	-3972	-3972	FY 84 Timber sale and Road construction		
			-5356	-5356	Existing Timber sales and roads		
			+23,719	+23,719	Addition of Unit Plan Roadless		
			+497	+887	Acreage Recalculation	53,188	53,088
Bitterroot National Forest:	3,800	3,800	-480	-480	Existing Timber sales and roads		
			+371	+371	Acreage Recalculation	3,691	3,691
Total:	42,100	41,610				56,879	56,779
Beaver Lake (1-003)	29,800	29,800	-18,011	-18,011	Existing Timber sales and roads		
			+1,685	+1,685	Acreage Recalculation	13,474	13,474
Saginaw Cr (1-004)	26,200	24,709	-17,408	-17,408	Existing Timber sales and roads		
			-299	+1,192	Acreage Recalculation	8,493	8,493
Tash Peak (1-005)	71,900	71,740	-10,143	-10,143	Exisitng Timber sales and roads		
			+522	+522	Acreage Recalculation	62,279	62,119
West Pioneers (1-006)	108,289	106,789	-2119	-2119	Existing Timber sales and roads		
(excluding West Pioneer MWSA area)			-14,380	-13,920	Acreage Recalculation	91,790	90,750
East Pioneers (1-008)	94,091	93,859	+59,804	+59,242	Addition of unit plan roadless		
			-3,342	-3,342	Boundary adjust. to meet roadless criteria		
			-5,430	-5,201	Acreage Recalculation	145,123	144,558
Call Mountain (1-009)	9,200	9,200	-371	-371	Existing Timber sales and roads		
			+1,355	+1,350	Acreage Recalculation	10,184	10,179
Cattle Gulch (1-010)	19,700	18,744	+76	+147	Acreage Recalculation	19,776	18,891
Fleecer (1-011)							
Beaverhead National Forest:	16,800	16,721	-1,051	-1,051	Boundary adjust. to meet Roadless criteria		
			+183	+183	Acreage Recalculation	15,932	15,853
Deerlodge National Forest:	21,867**	21,867**	-512	-512	Acreage Recalculation	21,355	21,355
Total:	38,667	38,588				37,287	37,208
Granulated Mountain (1-012)	14,700	14,660	+1,120	+1,120	Acreage Recalculation	15,820	15,780
Middle Mtn. Tobacco Root (1-013)							
Beaverhead National Forest:	66,200	65,173	-6,484	-6,484	Existing Timber sales and roads		
			-15	-353	Acreage Recalculation	59,701	58,336
Deerlodge National Forest:	38,100**	34,640**	-339	+351	Acreage Recalculation	37,761	34,991
Total	104,300	99,813				97,462	93,327
Potosi (1-014)	9,200	9,200	-3836	-3836	Existing Timber sales and roads		
			+101	+101	Acreage Recalculation	5,465	5,465
Bear Creek (1-015)	8,900	8,900	-469	-469	Existing Timber sales and roads		
			-179	-179	Acreage Recalculation	8,252	8,252
McKenzie Canyon (1-016)	34,500	34,310	-658	-658	Acreage Recalculation	33,842	33,652
Sourdough Mountain (1-017)	14,800	14,795	+43	+43	Acreage Recalculation	14,843	14,838
Timber Butte (1-018)	5,400	5,400	-382	-382	Acreage Recalculation	5,018	5,018
Dixon Mountain (1-019)	3,700	3,700	+282	+282	Acreage Recalculation	3,982	3,982
Four Eyes Canyon (1-020)	7,500	7,500	-644	-644	Acreage Recalculation	6,856	6,856

	1977 Inventory						
Inventoried Roadless Area	Gross Acres	Net Acres	Gross Change	Net Change	Reason	Revised Gross	Revised Net
Sheep Mountain (1-021)	31,700	31,063	+674	+1052	Acreage Recalculation	32,374	32,115
Crockett Lake (1-022)	6,700	6,700	+130	+130	Acreage Recalculation	6,830	6,830
Cherry Lakes (1-023)	14,700	14,700	-1760	-1760	Acreage Recalculation	12,940	12,940
Vigilante (1-024)	16,300	16,300	-1,969	-1,969	FY 84 Timber sale and road construction		
			+2,447	+2,127	Acreage Recalculation	16,778	16,458
Snowcrest Mountain (1-025)	99,800	99,797	-1,864	-1,864	Mineral activity and roads		
			-303	-303	Acreage Recalculation	97,633	97,630
Black Butte (1-026)	38,600	38,600	+1,187	+1,187	Acreage Recalculation	39,787	39,787
Big Horn Mountain (1-027)	51,300	50,820	-1,248	-1,248	FY 83 Road construction and timber sale		
			+818	+818	Acreage Recalculation	50,870	50,390
Lone Mountain (1-028)	13,900	13,900	+238	+238	Acreage Recalculation	14,138	14,138
Freezeout Mountain (1-029)	99,100	98,860	-2,810	-2,810	Existing timber sales and roads		
			-952	-952	Acreage Recalculation	95,338	95,098
Storm Lake (1-427)							
Beaverhead National Forest:	*	*	+1,953	+1,808	Transfer of administration	1,953	1,808
Deerlodge National Forest:	9,700**	7,620**	-1,953	-1,808	Transfer of administration		
			-142	-139	Acreage Recalculation	7,605	5,673
Total:	9,700	7,620				9,558	7,481
Anderson Mountain (1-942)							
Beaverhead National Forest:	30,600	30,542	-409	-409	Acreage Recalculation	30,191	30,121
Salmon National Forest:	***	***				18,577	18,120
Total:	30,600	30,542				48,768	48,241
West Big Hole (1-943)							
Beaverhead National Forest:	111,286	109,383	+28,961	+26,699	Addition of Unit Plan roadless		
			-952	-952	Mineral activity and roads		
			-7,180	-7,180	Existing Timber sales and roads		
			+1,789	+2,760	Acreage Recalculation	133,904	130,710
Salmon National Forest:	***	***				83,068	81,618
Total:	111,286	109,383				216,972	212,328
Goat Mountain (1-944)							
Beaverhead National Forest:	11,800	11,800	-2,367	-2,637	FY 83 Timber sales		
			+16	+16	Acreage Recalculation	9,454	9,454
Salmon National Forest:	***	***				35,488	35,468
Total:	11,800	11,800				44,942	44,922
Italian Peak (1-945)							
Beaverhead National Forest:	40,136	40,136	+50,174	+50,174	Addition of Unit Plan roadless		
			+967	+607	Acreage Recalculation	91,277	90,917
Targhee National Forest:	***	***				146,300	146,300
Salmon National Forest:	***	***				50,181	50,033
Total:	40,136	40,136				287,758	287,250
Garfield Mountain (1-961)							
Beaverhead National Forest:	37,000	36,990	-1,539	-1,539	Mineral activity and roads		
			+7,316	+7,326	Acreage Recalculation	42,777	42,777
Targhee National Forest:	***	***				47,500	47,500
Total:	37,000	36,990				90,277	90,277
Mt. Jefferson (1-962)							
Beaverhead National Forest:	4,600	4,600	-126	-126	Acreage Recalculation	4,474	4,474
Targhee National Forest:	***	***				60,000	60,000
Total:	4,600	4,600				64,474	64,474

*In 1977 Storm Lake acres for the Beaverhead National Forest were administered by the Deerlodge National Forest and included with their 1977 inventory acres.

**Inventoried in the 1979 RARE II Environmental Impact Statement.

***Not Available

a. Alternatives and Areas Recommended for Wilderness:

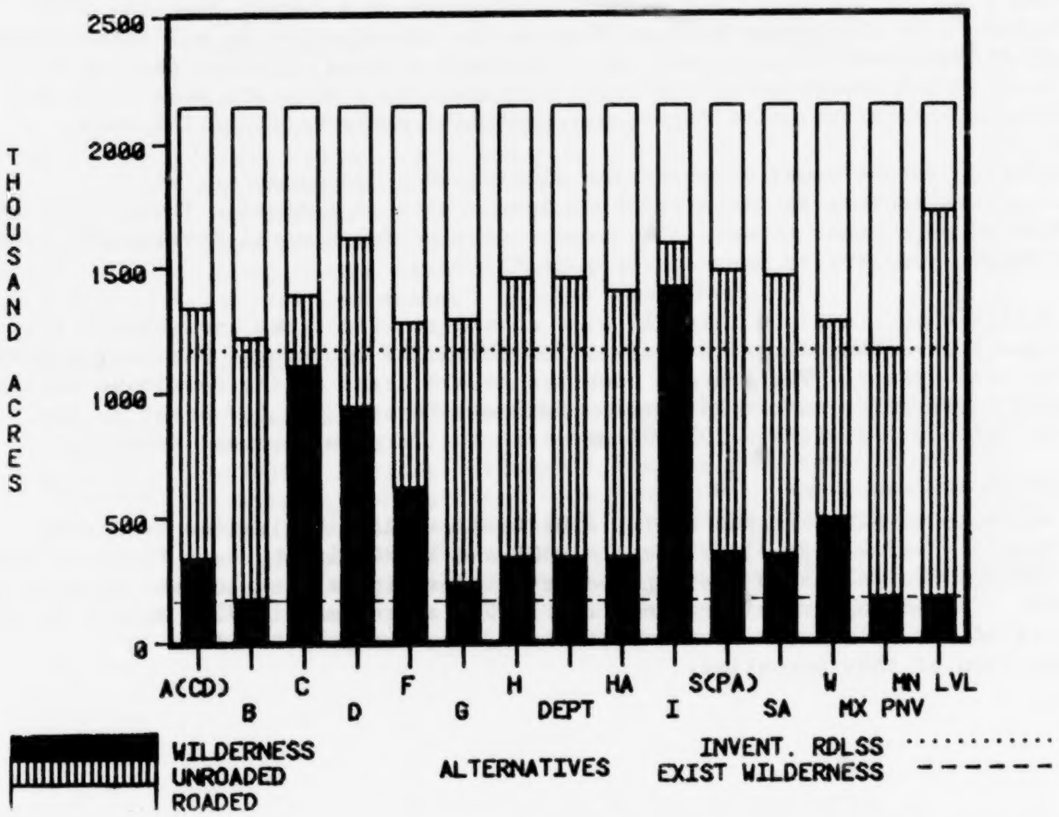
The alternatives were formulated to address various aspects of the roadless issue. Alternatives A,C,D,F,H,I,S and W specifically address public interests in the wilderness values of particular inventoried roadless areas. Alternative C recommends 75 percent of the inventoried roadless acres for wilderness while attempting to maintain or increase commodity production by intensively managing the other Forest lands.

Figure II-13 portrays the variation in amounts of wilderness, unroaded, and roaded management by Alternative. Unroaded management can apply to lands that include the inventoried roadless lands being evaluated for wilderness, the West Pioneer MWSA area, the lands released by the Lee Metcalf Wilderness Act, and unroaded lands that do not meet the roadless inventory criteria. Wilderness management can apply to lands that are already classified as wilderness or to the inventoried roadless areas. Figure II-13 also portrays the current situation for wilderness, unroaded, and roaded management on the Forest.

All alternatives except B recommend additions to the existing wilderness (Figure II-13). Alternative I recommends all 1,246,000 acres of inventoried roadless area for wilderness designation. The remainder of the alternatives propose varying amounts of additional wilderness.

Figure II-13

WILDERNESS, UNROADED MANAGEMENT AND ROADED ASSIGNMENTS



Alternative G recommends two small additions to the Anaconda-Pintler Wilderness, and two areas in the Italian Peaks which are contiguous to a larger wilderness proposal on the Salmon National Forest. A total of 62,000 acres are recommended.

Alternative W follows closely the recommendations of the Montana Wilderness Coalition. Slight adjustments to boundries were necessary in some areas to augment manageability. A total of 315,300 acres are recommended.

Alternatives H, Ha, and H(dept) recommend approximately 163,800 acres of additional wilderness. These recommendations closely correspond to the Forest's past recommendations in the West and North Big Hole, Storm Lake[*], and the East Pioneers, and add a wilderness proposal for the Italian Peaks.

Alternatives S and Sa wilderness recommendations are identical to those proposed in alternatives H and Ha with an additional acreage recommended for the Italian Peaks. The Italian Peak proposal is expanded to be compatible with adjacent proposals on the Targhee National Forest and the Salmon District of the Bureau of Land Management. This addition expands the proposal on the Beaverhead portion from 12,907 to 25,664. The total additional wilderness proposed for alternatives S and Sa is 169,400 acres.

Alternatives F,D, and C propose wilderness designation for 455,700, 772,400, and 933,700 acres respectively. Wilderness designations in these alternatives were prioritized to respond to public interest, to consider wilderness capability, and to avoid conflicts with other resources.

All alternatives except I and B retain Roadless Area 1-962, Mt. Jefferson, in further planning status. This area is contiguous to a larger roadless area administered by the Bureau of Land Management. Designation in all alternatives except Alternative I is deferred in the current planning process pending a decision on the remainder of the area. Alternative I proposes Area 1-962 for wilderness, and Alternative B proposes custodial management for the area.

In addition to the areas proposed for wilderness classification, all alternatives include lands on which no development is planned. These lands may be crossed with roads to access adjacent areas or for mineral development, but will remain essentially unroaded (Figure II-13).

The analysis portrayed in this EIS also considers wilderness designation for contiguous inventoried roadless areas for which the Beaverhead National Forest is the lead agency. These areas comprise 66,434 acres on the Deerlodge National Forest, 3,691 acres on the Bitterroot National Forest, 184,857 acres on the Salmon National Forest and 253,800 acres on the Targhee National Forest.

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[*] In response to public input on the 1982 Roadless Area Evaluation Brochure, the boundary between Roadless Areas A1-008 and F1-008 in the East Pioneers has been changed to recognize the high potential for mineral development in area F1-008. The acreage remaining in Area F1-008 (approximately 9500 acres) is not considered for wilderness in Alternatives H, Ha, H(dept), S and Sa in recognition of this potential.

Table II-5 shows by alternative the inventoried areas, including contiguous roadless areas for which the Beaverhead is the lead agency, that are recommended for wilderness. Each inventoried roadless area is considered for wilderness in at least one alternative and for nonwilderness in at least one alternative.

b. Management of Inventoried Roadless Areas

Table II-7 shows how the inventoried roadless areas would be managed Forest-wide under different alternatives. Multiple-use management prescriptions were formulated by a Forest interdisciplinary team and used in the FORPLAN computer model as a means of displaying the management that would be applied to specific analysis areas under different alternatives. For display purposes, management prescriptions with similar emphasis and/or impacts have been grouped and are represented by Groupings 1 through 5 in the chart.

The management prescriptions and the emphasis represented by each are grouped in the following manner:

Group 1: Designation- Wilderness (Designated and Proposed) and Further Planning

Description- Management emphasis is on managing classified wilderness in accordance with the Wilderness Act of 1964. Wilderness characteristics of areas proposed for Wilderness and remaining in Further Planning status will be protected until a final wilderness classification determination is made.

Group 2: Designation- Nonwilderness

Description- All of the multiple-use management prescriptions in this group provide for some level of timber harvest with associated road construction. The intensity of timber management varies depending on other management emphasis in each prescription. For example, one prescription in this grouping emphasizes management of elk/mule deer summer range "to provide the habitat components necessary to sustain reasonable populations of elk and mule deer". Special emphasis is given to forage/cover ratios. Timber production at "moderate intensity capital investment" is also emphasized.

Group 3: Designation- Nonwilderness

Description- Management emphasis is on high-intensity range management. Additional emphasis is given to retaining suitable wildlife habitat (primarily for big game species) and to providing recreational opportunities in semiprimitive areas. No regulated timber harvest is allowed in areas assigned this management emphasis. New roads normally will not be constructed; however, roads are not specifically prohibited.

Group 4: Designation- Nonwilderness

Description- Management emphasis in the multiple-use prescriptions in this grouping focus on providing and preserving primitive and semiprimitive recreation opportunities. Regulated timber harvest is not allowed under these prescriptions. New roads normally will not be constructed; however, roads are not specifically prohibited. "Special" recreation management areas are included in this grouping under several alternatives.

Group 5: Designation- Nonwilderness

Description- Multiple-use prescriptions in this grouping include those that emphasize combined high-intensity range and wildlife management, moderate or low-intensity range management, wildlife management, and management of riparian areas. No regulated timber harvest is allowed in areas assigned to these management emphasis. New roads normally will not be constructed; however, roads are not specifically prohibited.

A summary of management emphasis is displayed at the end of the Table to portray how the inventoried roadless will be affected through time. The roaded category indicates the rate of access into inventoried roadless lands which are assigned prescriptions which allow roads. The inventoried roadless category is a sum of inventoried roadless areas greater than 5,000 acres in size that will be available for future considerations for wilderness. Similar information is given for each inventoried roadless area in Appendix C.

3. Visual Quality

Visual quality objectives will be specified for each area of the Forest. These VQO's will indicate the degree to which the natural appearance of that landscape will be maintained over time with implementation of the prescription. The preservation objective is applied to wilderness and other special areas where the natural landscape should be unaltered by forest mangement activities. The retention objective is applied to areas where activities should not be evident to the casual forest visitor and partial retention to areas where activities may be evident but must remain subordinate to the natural landscape. Modification and maximum modification are applied to less visually sensitive areas where changes can dominate the natural landscape but should look natural from a distance (USDA, 1974, 1980).

The acreage assigned to each visual quality objective will not vary by alternative but the amount of alteration of the landscape resultant of planned management activities will vary commensurately with the degree of development planned for each alternative.

Table II-7

Alternative Designation for the Beaverhead National Forest
Inventoried Roadless Areas

Management Emphasis Groupings	Alternative									
	A	B	C	D	F	G	H	I	W	S
Beaverhead National Forest										
Group 1:* (M Acres)	172.3	0	930.2	675.4	430.6	53.7	160.5	1245.8	316.7	172.0**
Group 2:	296,904	331,323	205,125	29,542	311,044	283,382	212,829	0	275,785	149,999
Group 3:	0	146,178	772	8241	37,907	167,347	114,048	0	64,692	41,640
Group 4:	761,465	554,926	101,444	505,565	328,239	561,406	489,357	0	382,975	527,116
Group 5:	15,103	213,324	8258	27,037	138,921	179,962	269,036	0	205,632	354,989

* These totals include Roadless Areas 1-962 (4,474 acres), B1-013 (1,710 acres), and I1-945 (12,986 acres). 1-962 is designated as Further Planning in all alternatives except B and I; B1-013 and I1-945 are designated Further Planning in Alternative A only.

** Does not include 1073 acres which are recommended for wilderness but outside of the inventoried roadless areas because its area did not meet the 5000 acres roadless area requirement.

Contiguous Inventoried Roadless	A	B	C	D	F	G	H	I	W	S
Salmon National Forest										
Wilderness:	0	0	174,801	61,955	52,515	56,092	0	184,857	47,052	
Nonwilderness:	184,857	184,857	10,056	122,902	132,342	128,765	184,857	0	137,805	
Targhee National Forest										
Wilderness:	42,500	0	142,300	42,500	142,300	0	42,500	253,800	0	
Nonwilderness:	211,300	253,800	111,500	211,300	111,500	253,800	211,300	0	253,800	
Deerlodge National Forest										
Wilderness:	4114	0	39,105	39,105	39,105	0	4114	62,019	39,105	
Nonwilderness:	57,905	62,019	22,914	22,914	22,914	62,019	57,905	0	22,914	
Bitterroot National Forest										
Wilderness:	0	0	0	3139	0	0	0	3628	0	
Nonwilderness:	3691	3691	3691	552	3691	3691	3691	63	3691	

Beaverhead National Forest
Summary of Management Emphasis

		A	B	C	D	F	G	H	I	W	S
Roaded	Decade 1	172,974	199,041	151,531	0	212,769	255,696	150,090	0	246,469	125,255
	5	503,265	586,792	282,261	0	507,241	520,371	371,778	0	415,158	306,995
Remaining Inventoried: 1/	Decade 1	919,668	1,046,710	168,542	574,859	606,816	940,875	939,654	0	687,089	952,963
	5	589,377	658,959	37,812	574,859	312,344	676,200	717,966	0	518,400	771,223
Wilderness: (M Acres)		153.1	0	925.7	671.0	426.2	49.2	156.0	1245.8	312.2	167.5

1/ Further Planning Areas 1-962, B1-013, and I1-945 are shown as Remaining Inventoried in this total.

4. Research Natural Areas

The Forest currently administers two research natural areas (RNA). The two RNA's, Cliff Lake and Cottonwood Creek, total 3,801 acres and are located in the Gravelly Planning Unit. In addition, a number of areas are currently being evaluated for inclusion into the RNA system. Inclusion of these areas would not conflict with any alternative. The majority of proposed and candidate areas are located in wilderness or areas not scheduled for resource development, and will not present conflicts with other proposed land uses. All alternatives will maintain the existing RNAs and continue to evaluate other areas for inclusion.

5. Wildlife

All alternatives and benchmarks were designed to ensure the maintenance of minimum viable populations of wildlife and fish.

a. Elk Winter Range

All alternatives were designed to restrict domestic livestock use to 35 percent of the available forage on wildlife winter range. This percentage allows the winter range to carry a reasonable number of elk (11,650) without creating conflicts between wintering elk populations and local land owners. The summer populations of elk are maintained at 12,200 in all alternatives.

b. Elk Effective Cover

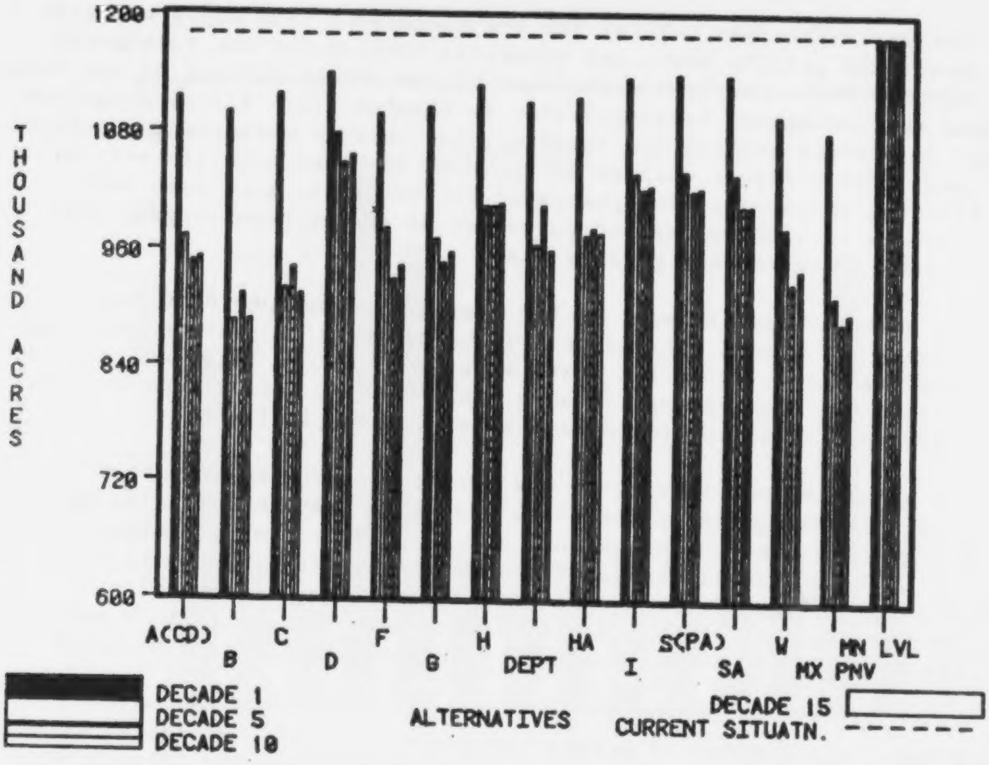
Although all alternatives provide sufficient habitat to support similar populations of elk, due to the winter range constraint, the quality of the security cover on summer range is affected by management. Elk effective cover as displayed in Figure II-14 decreases in all alternatives in the first five decades due to the amount of timber harvest and the amount of needed roads. Following period 10, the elk effective cover remains relatively stable due to the decrease in road building and the recovery of cover of cutover areas balancing the loss of cover in new harvest units. Elk cover is necessary to provide a stable quality hunting experience. Decreases in the amount or quality of security cover means elk are more vulnerable to being killed by hunters and in a shorter period of time. This may result in more restrictive hunting regulations to maintain elk populations. (Figure II-14 displays acres above 600,000 and outer decade figures are projected, based on continued implementation of the altenatives).

Alternative B has the highest adverse impact on elk effective cover because of the large amount of timber harvest and high number of miles of road scheduled for construction. Alternative D retains a greater number of acres of elk effective cover due to the small amount of scheduled timber harvest.

c. Harvest Intensity Index

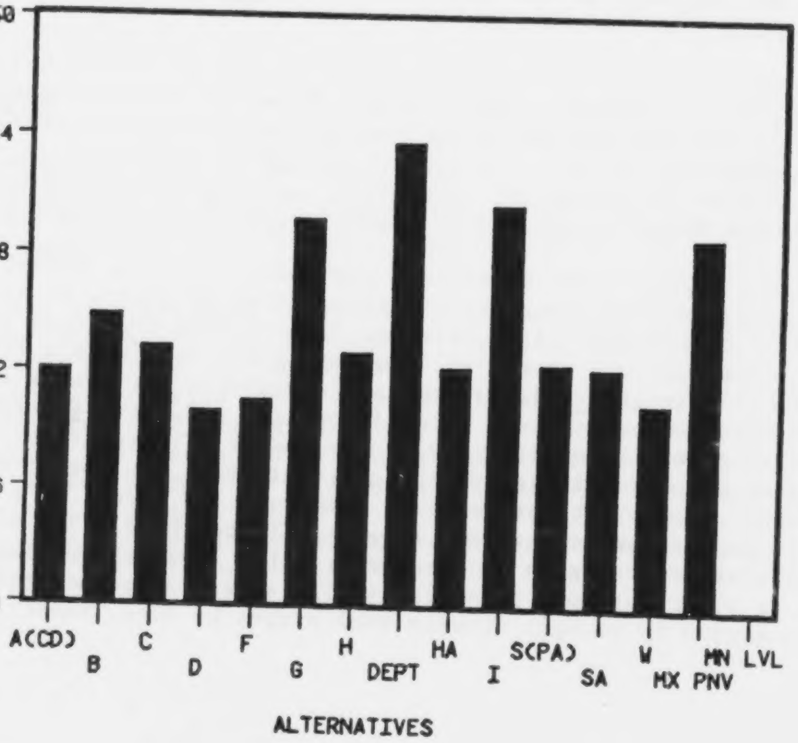
Alternatives with high harvest levels concentrated in a small timber base may adversely affect key wildlife habitat components. Figure II-15 displays harvest intensity index which is the cumulative amount of scheduled harvest divided by the acres assigned regulated timber management prescriptions for each alternative. Lower numbers indicate that harvest acres are spread across a larger area, thus reducing the potential to impact key habitat components. (See Appendix B for analysis procedures used to determine elk effective cover, and intensity index.) (Figure II-15 displays index ratings above 20 and outer decade figures are based on continued implementation of the alternatives).

Figure II-14



ELK EFFECTIVE COVER

Figure II-15



INTENSITY OF MANAGEMENT ON SUITABLE LANDS

d. Threatened and endangered wildlife

The Forest currently provides habitat for the endangered bald eagle and gray wolf, the threatened grizzly bear, and potential habitat for the endangered peregrine falcon. For a complete discussion of the extent and use of the Forest by threatened and endangered species, refer to Chapter III. All alternatives will provide or protect habitat for these species through management standards and guidelines. The biologic opinion of the U.S. Fish and Wildlife service concludes that the proposed action presented in the EIS is likely to have beneficial effects on bald eagles and no effect on the endangered gray wolf, peregrine falcon, or threatened grizzly bear.

The Forest is an active participant in the Greater Yellowstone Bald Eagle Management Plan. All Forest activities will be designed to protect existing bald eagle nesting sites, to retain perch trees adjacent to lakes and rivers used by the eagle for fishing, and in some cases habitat improvement such as modifying individual trees to provide suitable nesting platforms.

The Forest is an active participant in the Continental Divide Gray Wolf Coordination Plan. Management under all alternatives may include closing roads in areas of suspected use during portions of the year or timing management activities to avoid adverse impacts. Prior to ground disturbing activities in suspected wolf habitat, management under all alternatives will require a biological evaluation. If the evaluation determines that an activity may affect the wolf, the Forest will formally consult with the U.S. Fish and Wildlife Service.

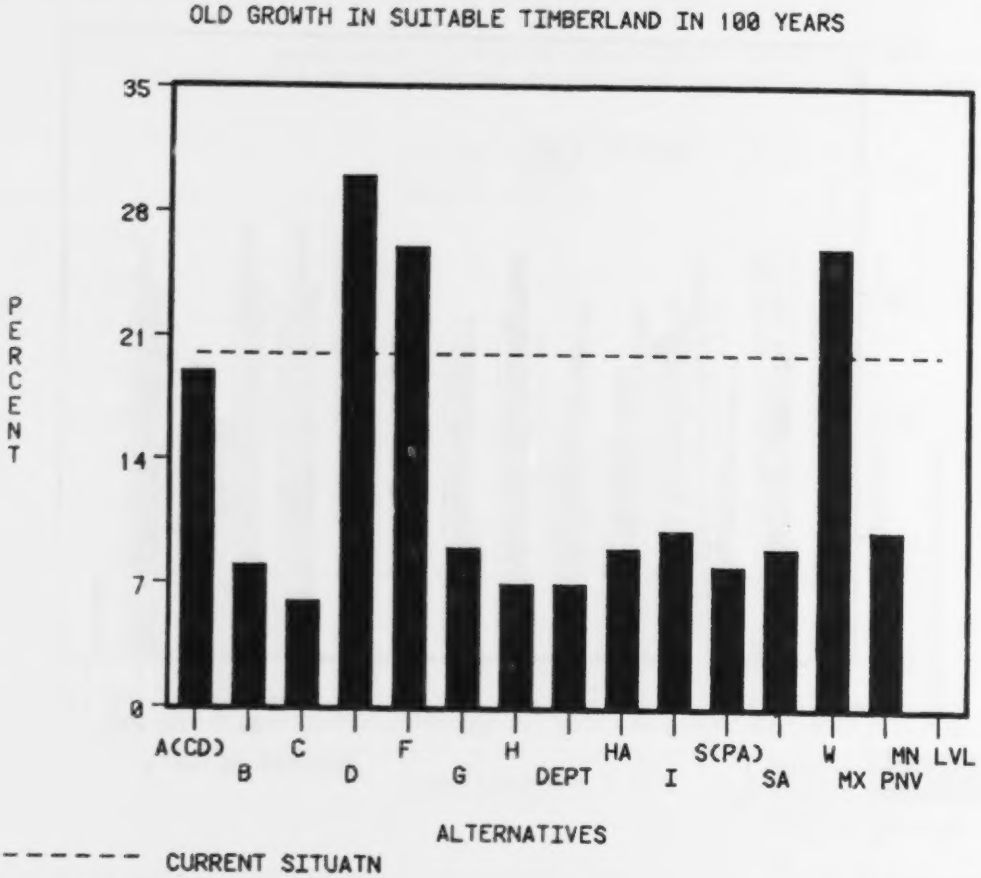
The grizzly bear is suspected of inhabiting portions of the Madison Range within the Lee Metcalf Wilderness, and is an occasional visitor to the Tobacco Root Mountains and the Gravelly Range. Under all alternatives, efforts will be made to increase knowledge of potential grizzly bear use and habitat on the Forest. The Forest is not included in the "occupied habitat" identified in the Greater Yellowstone Grizzly Bear Recovery Plan.

The peregrine falcon is not known to currently occupy the Forest but may migrate or be artificially introduced in the future. Potential habitat occurs along rocky cliff type habitats not currently planned for Forest management activities under any alternative.

d. Old Growth

Old growth timber stands occur throughout the Forest. As the Forest is managed, this habitat component will decrease. Within a hundred years, as little as six percent of the timber base will be retained in oldgrowth condition in some alternatives. However, old growth will be maintained outside the regulated timber base in wilderness, roadless and land unsuitable for timber management. In 100 years, old-growth dependent wildlife species will have greater amounts of old-growth habitat in alternatives A,D,F,S,Sa and W. (Figure II-16). (Projected, based on continued implementation of the alternatives). In the other seven alternatives, old-growth habitat is less. The expected result is a reduction in these wildlife populations within the regulated timber base. The amount of old-growth habitat occurring in wilderness or other areas where timber will not be harvested is dependent upon potential of the sites to produce trees and potential conversion to younger successional stages by fire, insects or disease.

Figure II-16



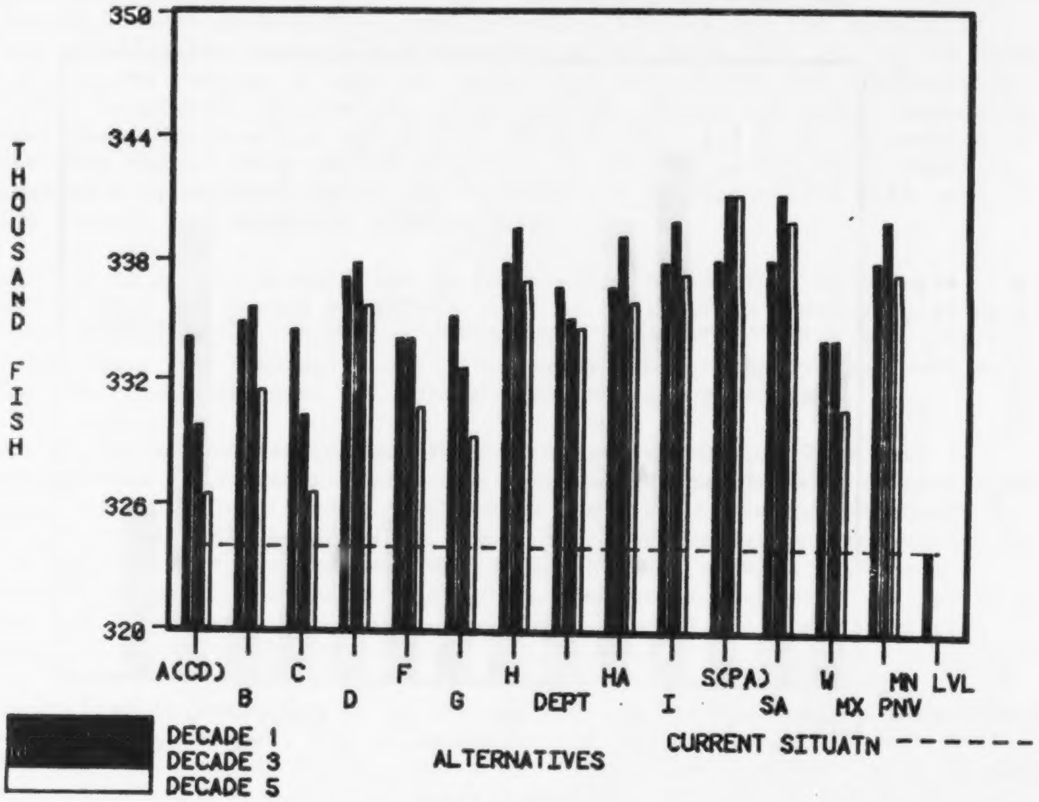
6. **Fish**

Catchable fish populations on the forest are affected by four items--maintenence of riparian vegetation in grazing allotments, the amount of sediment reaching the stream, the formation of pools formed by logs entering the stream, and habitat improvements.

All alternatives were designed to protect riparian vegetation along fishery streams by restricting utilization levels in grazing allotments. All alternatives also provide for recruitment of logs to form pools by limiting harvest in timbered riparian areas to selection and group selection harvest systems. Therefore, fish populations vary by alternative due to the level of sediment reaching the stream and the amount of habitat improvement work scheduled. Sediment production is discussed in section (7). Potential fish populations are displayed in Figure II-17. (Figure II-17 displays potential stream trout above 320,000 and outer decades are based on continued implementation of the alternatives).

Figure II-17

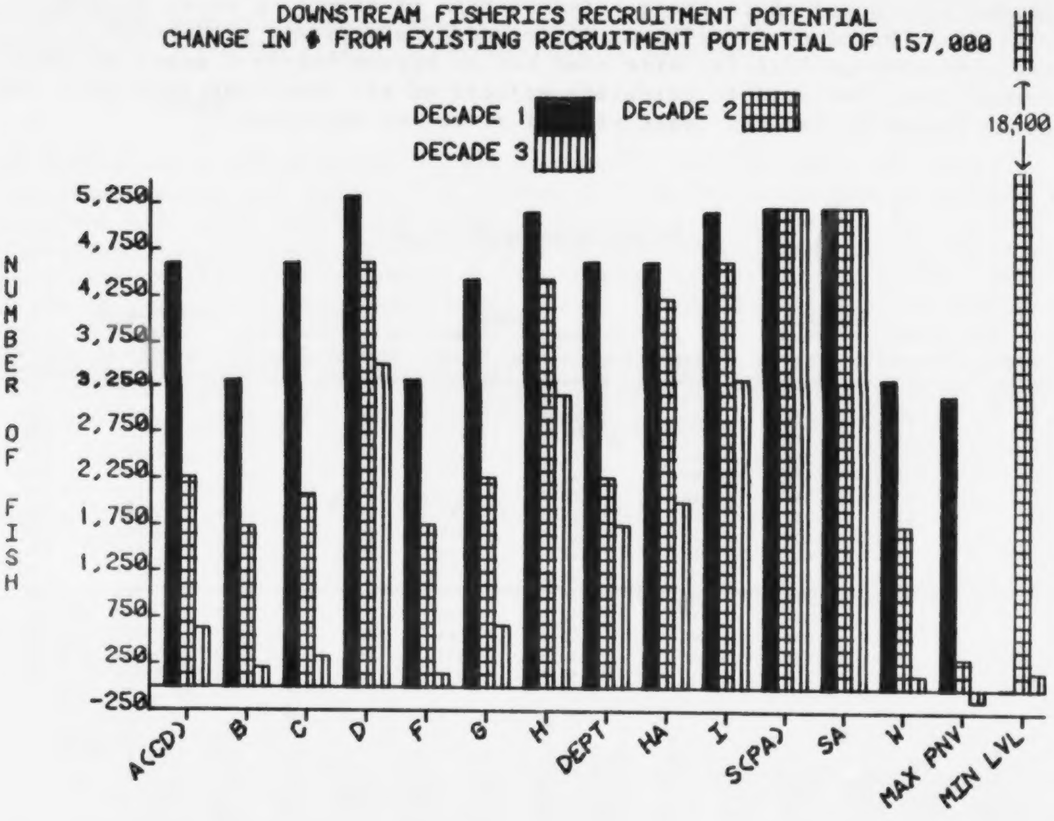
POTENTIAL CATCHABLE STREAM TROUT



All alternatives show a rise in potential fish populations in the first decade over existing potential. These increases result from restrictions placed on permitted grazing in riparian areas designed to improve existing fishery habitat, and the installation of structural habitat improvements. Populations in some of the high harvest alternatives (B, C, & G) drop below first decade levels by the second decade, and all alternatives drop slightly by the third decade. These decreases in population result from increased sedimentation of the streams from road construction and timber harvest. Although potential populations fall below the high found at the end of decade one, catchable fish populations do not fall below current populations in any of the alternatives.

The Forest currently produces 157,350 adult fish which are available for recruitment to the downstream fisheries. In all alternatives this number increases in the first decade commesurate with increases in total population potential due to implementation of grazing restrictions in riparian zones and completion of habitat improvements. Recruitment drops in the succeeding decades due to sedimentation caused by road construction and timber harvest. In most alternatives this number stays above current levels; however, in alternative B and the Max PNV benchmark, the number of fish available for recruitment drops slightly. The total change in numbers of fish available for recruitment to the downstream fisheries is displayed in Figure II-18. Large increases shown in the minimum level benchmark occur due to the curtailment of grazing on the Forest after the first decade.

Figure II-18



7. Sediment Production/Water Quality

Sediment production can be generated both by increased water yields and ground disturbances. The principal activity resulting in increased water yields from the Forest is the loss of vegetative cover from timber harvest. Other activities that contribute to increased water yield are the clearing associated with road construction, mineral exploration and development, domestic livestock grazing, and slash disposal and site preparation following timber harvest.

Ground disturbance increases the risk of increased sediment yields. Ground disturbing activities include road constuction, mineral exploration and development, timber harvest and the associated slash disposal and site preparation, and domestic livestock grazing, especially in riparian zones. The actual risk of increased sediment yield will vary depending on the amount of soil disturbance, the type of treatment, soil material, and various other physical and biological factors. As roads stabilize and disturbed sites revegetate, sediment production from any given source decreases. (Boyce, 1975, Cline, 1980, Megahan, 1972, 1974)

Table II-8 displays the amounts of major sediment producing activities for the alternatives, as indicators of their sediment production potential. Using road construction and timber harvest levels as the principal indicators, the alternatives are ranked as to their relative risk of affecting water related beneficial uses, based on significant differences in sediment production potential. (An average 17.1 ft. wide road bed or approximately 2 acres per mile of disturbed area, was used to calculate effects of all road construction). The alternative ranked #1 has the least risk of affecting such uses.

Table II-8

Sediment Producing Activities

Rank	Alternatve/ Benchmarck	Decade 1			Decade 5			Decade 10		
		Road Construction (miles/yr)	Timber Harvest (acres/yr)	Grazing (MAUM/yr)	Road Construction (mile/yr)	Timber Harvest (acres/yr)	Grazing (MAUM/yr)	Road Construction (miles/yr)	Timber Harvest (acres/yr)	Grazing (MAUM/yr)
1	Min Level	0	0	144	0	0	0	0	0	0
2	D	29.7	2949	186	20.1	2713	189	12.6	5407	184
3	I	33.2	3344	178	22.8	3919	189	14.3	4168	180
4	S	33.8	2868	190	21.7	5244	194	13.5	3945	192
5	Sa	35.9	3003	189	23.4	5498	193	14.6	4437	191
6	H	37.8	3422	192	25.0	6137	209	15.6	3978	192
7	DEPT	43.6	5677	199	29.3	8103	198	17.9	5287	201
8	Ha	45.0	4049	191	29.9	7904	208	18.6	4262	191
9	A	52.4	4572	190	36.5	6390	201	22.9	5715	193
10	C	53.3	4259	182	36.7	8408	210	23.0	3797	184
11	G	53.3	5695	185	36.4	6317	195	22.8	[illegible]934	188
12	F	60.6	5648	192	42.3	5786	202	26.5	9107	187
13	W	61.0	5801	195	42.9	5764	203	26.9	9133	190
14	B	63.5	4505	184	44.6	8941	206	28.0	8654	185
15	Max PNV	72.1	6909	180	51.4	6951	201	32.3	10438	182

* Outer decade figures are based on continued implementation of the alternatives.

The amount of disturbance caused by mineral exploration and development on the Forest at this time is minimal. If significant amounts of minerals are located, the associated road construction and ground disturbance caused by mining and drilling could produce significant sedimentation.

Management practices will be used in all alternatives to carry out these activities to assure that they will accomplish Forest Plan goals, one of which is to meet and/or exceed State of Montana Water Quality Standards. These practices are referred to as best management practices. Best Management Practices are described in the Glossary. A list of those management actions which constitute BMPs is located in an appendix to the Forest Plan.

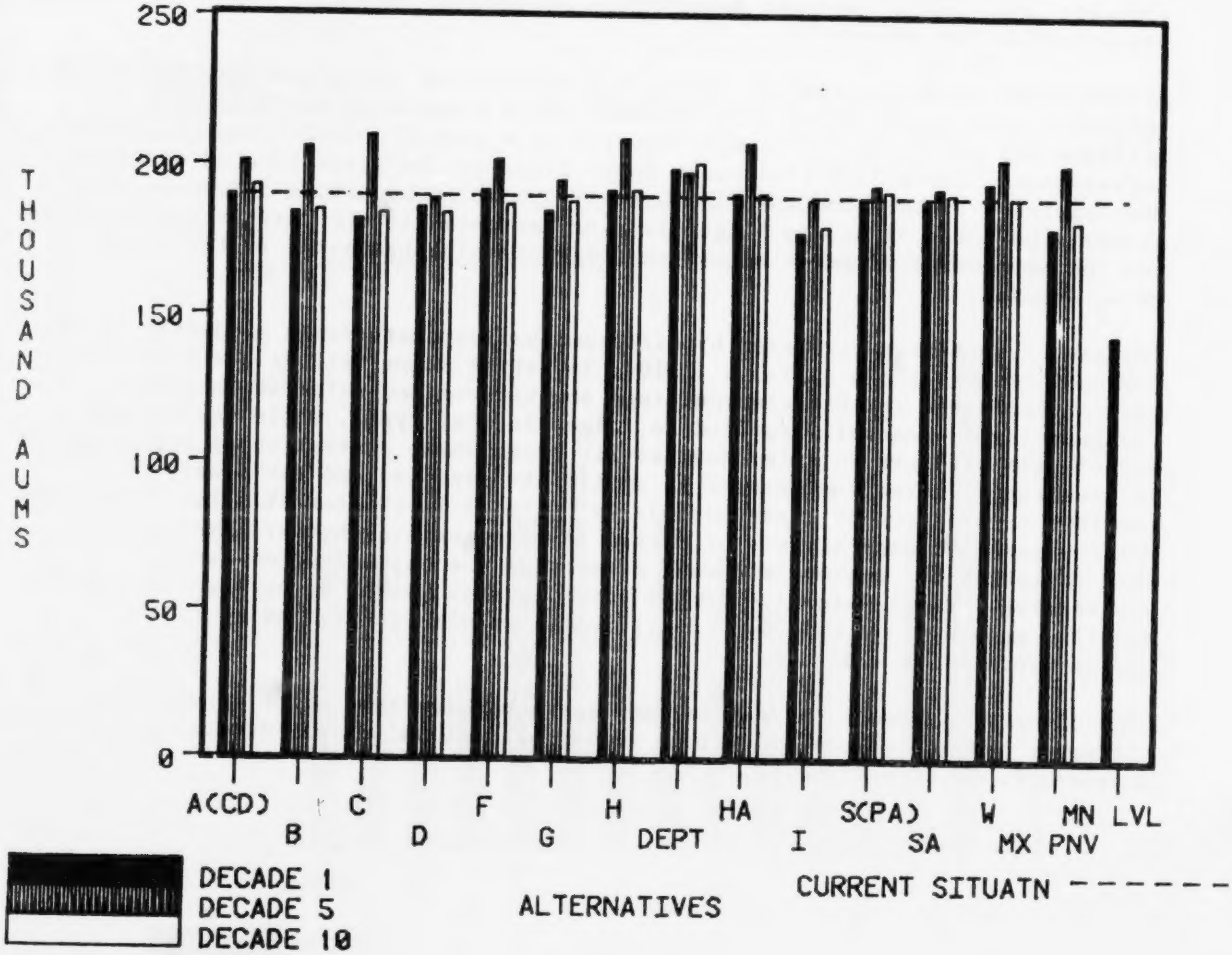
Road construction is the major producer of sediment on the Forest; therefore, this factor, more than the other, determines the ranking of alternatives. Due to the higher sediment production levels, it would be more costly to meet Forest water quality goals for Alternatives B, F and W and a greater risk that water quality might be impacted in spite of application of best management practices.

The effects of sediment production and flow increases on water related beneficial uses will be evaluated during project development to ensure meeting Forest water quality goals. Projects which will not meet State water quality standards will be redesigned, rescheduled, or dropped.

8. **Range**

The Forest currently provides forage to support 190,000 AUM's of domestic livestock grazing per year. This forage is largely located on permanent rangeland with some transitory range being utilized in the Big Hole area. The majority of the increase in AUM's shown in the alternatives is dependant upon utilization of transitory range created through timber harvest. The increase in forage on transitory range will be difficult to utilize due to its scattered occurrence, conflicts with reforestation efforts, and in some cases the lack of available water sources. The potential AUM's available by alternative are displayed in Figure II-19. (Outer decade figures are projected, based on continued implementation of the alternatives).

Figure II-19 POTENTIAL LIVESTOCK FORAGE



9. Timber Harvest

Harvest volumes and schedules were calculated by the FORPLAN computer model. Cubic foot and board foot volumes scheduled for harvest in decades 1, 3, 5, 10 and 15 are displayed in Figures II-20, and II-21. (Outer decade figures are projected, based on continued implementation of the alternatives).

The conversion ratio of cubic feet to board feet varies from 2.8 to 3.2. This conversion ratio varies due to size and species of trees harvested. Many of the alternatives exhibit high board foot harvests in the first five decades compared to decades six through ten. This is a result of the FORPLAN model selecting high value, larger diameter mixed conifer stands for harvest (which have the higher conversion ratios), before the lower value, smaller diameter lodgepole stands.

All land managed by the Forest was tested for suitability for production of timber by applying the criteria discussed in Appendix B, section II. Tentatively suitable timber lands were assigned prescriptions that meet the management objectives of a given alternative. High timber output alternatives have the most acreage assigned regulated timber prescriptions (Figure II-22). As emphasis shifts from producing timber to maintaining roadless recreation, elk security areas and wilderness management, the acreage assigned regulated timber prescriptions decreases.

Alternatives H, Ha, H-dept, S, and Sa are constrained to harvest mostly mature lodgepole pine in the first four decades. This constraint was developed to mitigate the effect on the timber resource of a possible mountain pine beetle infestation. Table II-9 (following page) displays the percentage of acres in the regulated timber base that is currently occupied by mature lodgepole pine stands, the acres of mature lodgepole pine harvested in the first three decades, and the percentage of acres of mature lodgepole pine harvested in the first three decades.

The amount of timber harvested by different harvest methods as projected by the FORPLAN model is shown in Table II-10. The three major methods available for use on the forest include clearcutting, shelterwood and selection harvest. Clearcutting is generally applied to lodgepole pine types, while shelterwood methods are utilized in drier Douglas-fir types where protection of regeneration is necessary. Selection harvest is applied in riparian and wet areas. A complete explanation of these methods is included in chapter IV. The figures do not represent acreage targets by method for alternatives but are projections that represent the appropriate ways of meeting the objectives of each alternative. Final determination of which harvest method is applied to a specific area will be made by a certified silviculturist following an on-the-ground site analysis.

(The changes in timber harvest volumes and schedules that might result from different harvest values and future timber harvest values are discussed in Appendix B, Section IV, B, 3, a.)

Figure II-20

BASE TIMBER SALE SCHEDULE

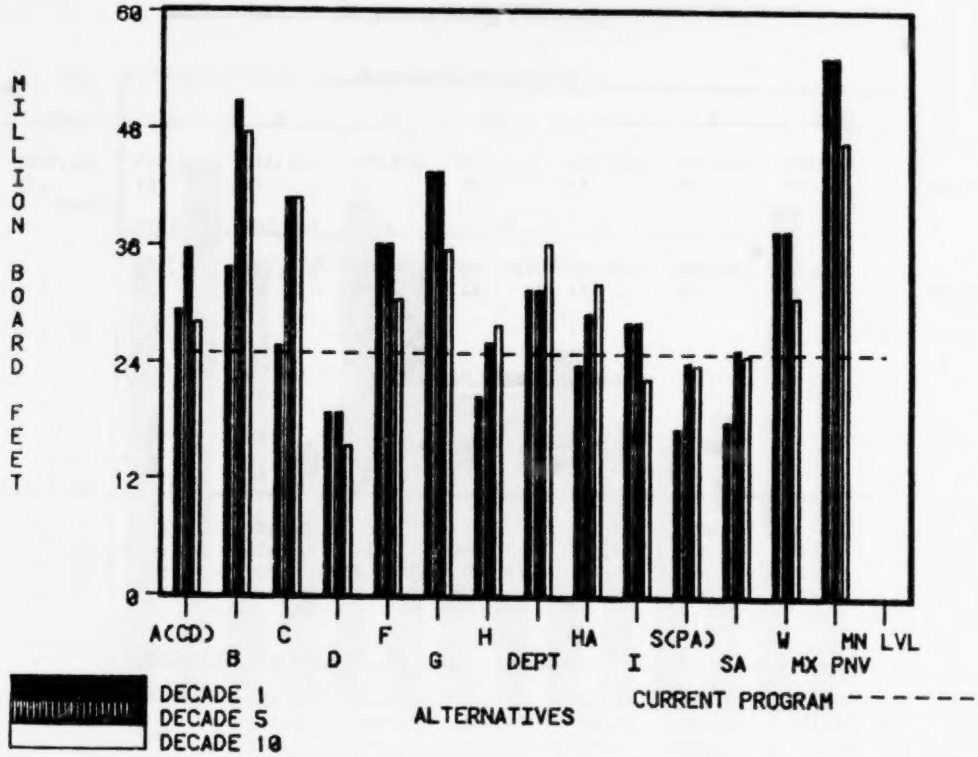


Figure II-21

BASE TIMBER SALE SCHEDULE (MMCF)

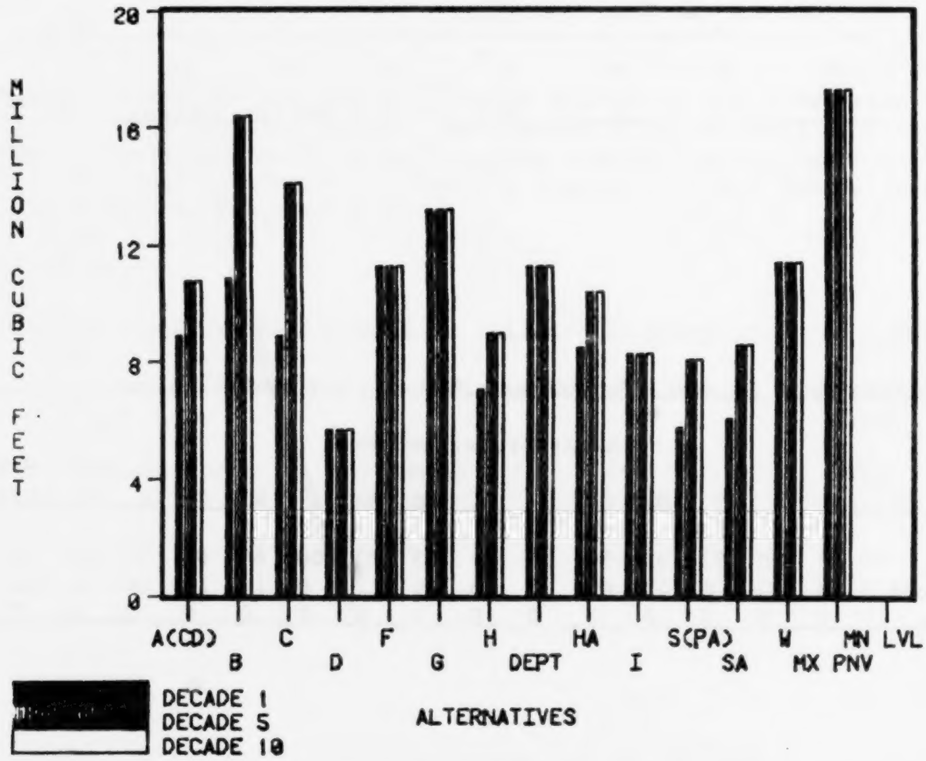


Table II-9

Acres and Percentage of LPMSAW Allocated in the Timber Base

Alternative/Benchmark

	A	B	C	D	F	G	H	DEPT
Acres	351,398	380,126	339,276	176,348	368,917	281,410	236,579	236,579
Percentage	66	58	63	56	61	51	63	63

	Ha	I	S	Sa	W	MAX PNV	MIN LEVEL
Acres	262,791	192,991	214,783	225,790	364,145	441,257	597,736
Percentage	61	56	63	62	59	60	28

Acres of LPMSAW Harvested

Alternative/Benchmark

	A	B	C	D	F	G	H	DEPT	L
Decade 1	0	30,608	34,733	0	104	26,447	27,912	50,366	
Decade 2	46,168	46,377	48,500	13,660	31,413	32,416	38,145	59,539	
Decade 3	15,522	42,892	32,786	18,970	36,540	23,289	38,509	56,079	
Decade 4	33,558	44,257	57,074	4,592	21,677	31,248	34,209	34,707	

	HA	I	S	Sa	W	MAX PNV	MIN LEVE
Decade 1	34,183	18,407	21,880	23,030	0	35,540	0
Decade 2	44,234	21,448	21,880	23,030	29,609	60,593	0
Decade 3	45,471	15,029	21,880	23,030	36,997	23,479	0
Decade 4	39,031	28,792	21,880	23,030	19,186	58,938	0

Percentage of the Allocated LPMSAW harvested the first 30 years

Alternative/Benchmark

A	B	C	D	F	G	H	DEPT
17	32	34	19	18	29	44	70

Ha	I	S	Sa	W	MAX PNV	MIN LEVEL
47	28	31	31	18	27	0

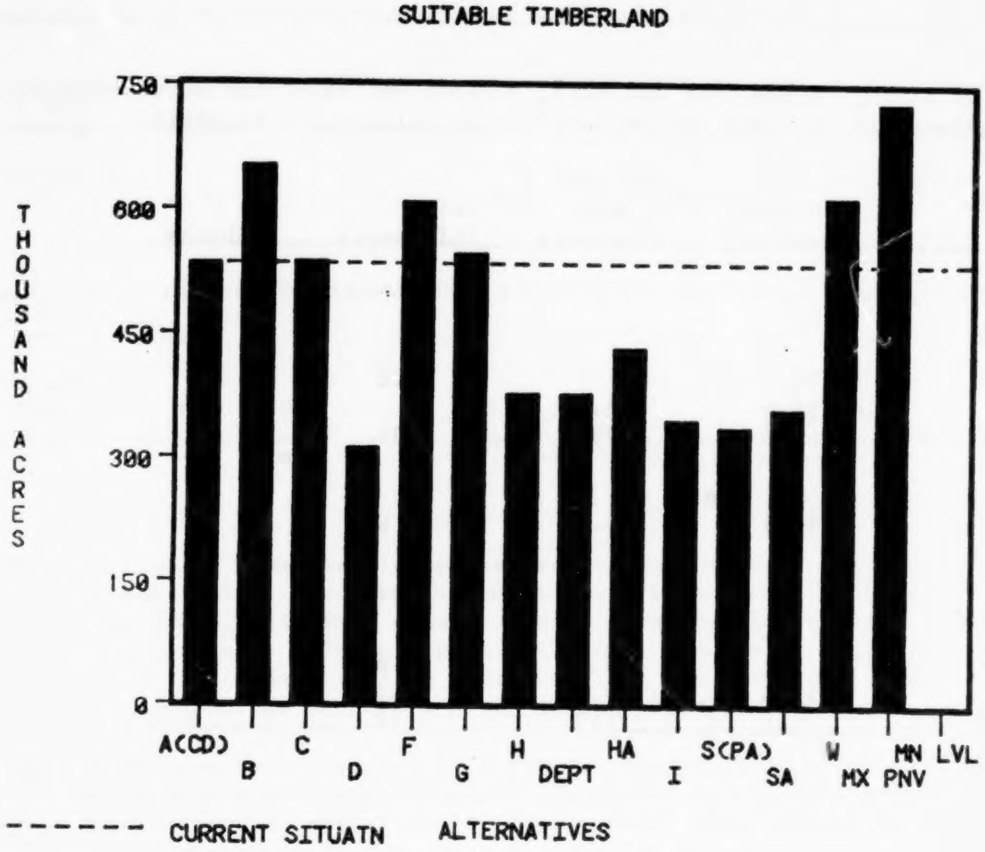
Table II-10

Timber Harvested in Decade 1 By Harvest Method (% of total volume)

Alternative/Benchmark

	A	B	C	D	F	G	H	Hd	Ha	I	S	Sa	W	MAX PNV	MIN LVL
Clearcut	51	100	98	53	58	91	84	93	83	100	84	84	56	100	0
Shelterwood	49	0	0	47	42	9	16	6	17	0	16	16	44	0	0
Selection	0	0	2	0	0	0	0	1	0	0	0	0	0	0	0

Figure II-22



All alternatives reflect revised utilization standards that were prescribed for use in the Northern Regional Guide. The results of an analysis of the volume and economic value impacts of converting from the current utilization standards to those in the Regional Guide are shown in Figure II-23 and Tables II-11 through II-13 for the Proposed Action.

Figure II-23

Comparison of Current vs Regional Guide Utilization Standards

	Minimum D.B.H.		Minimum top D.I.B	Minimum Piece length
Standard	Lodgepole Pine	All Other Species	All Species	All Species
Current	7"	8"	5.6"	8'
Regional Guide	6"	7"	4.6"	8'

Table II-11

Comparison of timber volume (MCF and MBF), Present Net Value and acres assigned to timber between the current and Regional Guide utilization standards.

Item	Current Standards	Regional Guide Standards	Unit Difference	% Change
Max PNV Benchmark				
MMCF	16.1	17.3	1.2	7
MMBF	52.4	55.4		
PNV MM$	262	298	36	12
Acres Assigned to Timber	730.6	730.6	0	0
Preferred Alternative				
MMCF	5.2	5.8	.6	10
MMBF	15.9	17.3	1.4	
PNV MM$	131	140	9	6

Table II-12

Comparison of Timber Volume by Species for Current and Regional Guide Standards.

Current Stds	AF	ES	DF	WBP	LP	Total
1st Decade MMCF	2.814	2.645	7.528	3.014	35.894	51.894
5th Decade 1/ MMCF	5.089	7.177	14.343	6.090	43.075	75.774
Regional Guide	AF	ES	DF	WBP	LP	Total
1st Decade MMCF	3.143	2.899	8.057	3.374	40.823	58.296
5th Decade MMCF	5.383	7.494	14.831	6.615	46.822	81.144

1/ Outer decade figures are projected, based on continued implementation of the alternatives.

Table II-13

Comparison of Harvest Volume by Diameter Class for Current and Regional Guide Standards.

Current Stds 1/	8.0-8.9	9.0-9.9	10.0-10.9	11.0-11.9	12.0-12.9	13.0-13.9	14.0-14.9	15.0-15.9	16.0-16.9	Total
1st Decade MMCF 2/	42.774							9.121		51.894
5th Decade 3/ MMCF	48.743		1.616	2.270		6.665			16.479	75.774
Regional Guide	**8.0-8.9**	**9.0-9.9**	**10.0-10.9**	**11.0-11.9**	**12.0-12.9**	**13.0-13.9**	**14.0-14.9**	**15.0-15.9**	**16.0-16.9**	**Total**
1st Decade MMCF	48.759					9.537				58.296
5th Decade MMCF	53.539	1.670		4.922	4.351			16.663		81.144

1/ Volume by diameter figures represent average stand diameters for FORPLAN yield tables. Only two yield tables are accessed in the first decade. The 8.0-8.9 diameter class represents mature stands which are predominantly lodgepole pine with small amounts of other species. The 15.0-15.9 diameter class represents average diameters in mature mixed conifer stands which are predominantly Douglas-fir.

2/ Board foot volumes for the first decade are based on an average MMBF/MMCF conversion ratio calculated for the first five decades. Conversion of cubic foot volumes to board foot volumes by diameter class is not appropriate for these figures but may be approximated using an average 3:1 conversion.

3/ Outer decade figures are projected, based on continued implementation of the alternatives.

10. Minerals

Geologic favorability and access categories for both energy and nonenergy resources have been evaluated for the Forest. Energy and nonenergy resources are defined as:

> ENERGY - resources include: oil & gas (OG), geothermal (GRM), uranium or thorium (U,Th), coal (COL), and oil shale (OS).
>
> NONENERGY - resources include: precious metals (PM), base metals (BM), nonenergy leaseables such as phosphates (NEL), nonmetallic locatables (NM) and common variety materials such as decorative building stone. (CV).

The four categories of geologic favorability are:

VERY HIGH FAVORABILITY - Areas where a number of geologic characteristics are present that indicate the occurrence of a given resource. Unfavorable characteristics are few or absent. At least some characteristics are diagnostic of a particular mineral deposits model. Information on past, present, and planned activity in the area supports or reinforces the area's geologic favorability.

HIGH FAVORABILITY - Areas where a number of geologic charateristics are present that indicate the occurrence of a given structure.

MEDIUM FAVORABILITY - Areas where some geologic characteristics are present that are favorable for the occurrence of a given resource.

LOW FAVORABILITY - Areas where a few geologic characteristics favorable for the occurrence of a given resource are present.

Using the above information the Forest lands were placed in four categories:

Category A TOTALLY RESTRICTED - Statutory or discretionary withdrawls from mineral entry or mineral leasing, e.g., no mining claims and no leases in some cases.

1. Wilderness areas.
2. Wild and scenic rivers
3. Sites for facilities
4. Historic and cultural sites
5. Developed recreation sites.

Category B HIGHLY RESTRICTED - Access to mining claims will be difficult and costly. Leases will have surface occupancy highly restricted or prohibited.

1. Congressionally mandated wilderness study areas.
2. RARE II Further Planning areas.
3. T&E species habitats
5. Roadless (Type I) dispersed recreation areas.
6. Culturally significant areas.

Category C MODERATELY RESTRICTED - Leases and operating plans usually show seasonal stipulations.

1. Big game winter range.
2. Elk calving areas.

Category D STANDARD RESTRICTIONS - All practices in accordance with standard Forest Service operating procedures and mandated environmental protection measures.

1. Timber production areas.
2. Existing mineral processing areas.

The land area available for mineral entry and the constraints imposed by each alternative is shown in Table II-14. The Forest road system will provide mineral access when it is completed in about 50 years. The area of the Forest projected to be roaded varies by alternative (Figure II-24). Almost eight percent of the Forest is currently classified wilderness where no further mineral entry or mineral leasing is allowed.

Table II-14 Mineral Evaluation Report

Alternative A

Energy					Non-Energy				
Access Category	Low	Mod	High	Very High	Access Category	Low	Mod	High	Very High
A	34,914	295,362	0	0	A	0	197,234	62,443	70,599
B	12,914	176,335	16,648	2,395	B	0	42,109	11,401	154,782
C	972	104,522	1,878	722	C	0	50,639	10,238	47,217
D	58,218	871,502	310,249	260,890	D	0	852,718	340,950	307,191

Alternative B

Energy					Non-Energy				
Access Category	Low	Mod	High	Very High	Access Category	Low	Mod	High	Very High
A	34,914	142,253	0	0	A	0	176,917	210	40
B	659	115,974	19,317	3,369	B	0	34,968	15,541	94,198
C	31,677	467,849	178,715	157,401	C	0	180,206	88,595	155,223
D	39,768	721,645	130,743	103,237	D	0	750,609	320,686	330,328

Alternative C

Energy					Non-Energy				
Access Category	Low	Mod	High	Very High	Access Category	Low	Mod	High	Very High
A	61,848	545,388	288,086	207,523	A	0	706,716	248,226	147,903
B	4,038	107,953	223	759	B	0	26,837	12,903	73,233
C	10,725	171,486	7,570	12,044	C	0	95,195	33,574	73,056
D	30,407	622,894	32,896	43,681	D	0	313,952	130,329	285,597

Alternative D

Energy					Non-Energy				
Access Category	Low	Mod	High	Very High	Access Category	Low	Mod	High	Very High
A	61,848	466,273	155,711	164,227	A	0	557,889	186,820	103,350
B	4,478	211,991	45,525	15,226	B	0	84,292	53,891	139,037
C	22,229	301,188	52,633	25,148	C	0	192,225	69,142	139,831
D	18,463	468,269	74,906	59,406	D	0	308,294	115,179	197,571

Alternative F

Energy					Non-Energy				
Access Category	Low	Mod	High	Very High	Access Category	Low	Mod	High	Very High
A	45,990	366,504	41,169	149,670	A	0	433,455	93,629	76,249
B	5,277	117,003	29,377	12,747	B	0	45,905	27,993	90,506
C	39,087	559,430	146,941	40,565	C	0	370,143	181,378	234,502
D	16,664	404,784	111,288	61,025	D	0	293,197	122,032	178,532

Table II-14 cont.

Alternative G

Energy					Non-Energy				
Access Category	Low	Mod	High	Very High	Access Category	Low	Mod	High	Very High
A	34,914	150,632	40,631	170	A	0	224,289	2,018	40
B	3,004	139,404	0	0	B	0	18,517	12,730	111,161
C	33,492	460,157	147,920	138,126	C	0	446,391	178,564	154,740
D	35,608	697,528	140,224	125,711	D	0	453,503	231,720	313,848

Alternative H

Energy					Non-Energy				
Access Category	Low	Mod	High	Very High	Access Category	Low	Mod	High	Very High
A	34,914	287,723	14,218	120	A	0	213,027	62,443	61,505
B	95	124,586	545	0	B	0	35,330	9,997	79,899
C	30,877	469,367	188,139	171,093	C	0	504,509	199,107	155,860
D	41,132	566,045	125,873	92,794	D	0	389,834	153,485	282,525

Alternative I

Energy					Non-Energy				
Access Category	Low	Mod	High	Very High	Access Category	Low	Mod	High	Very High
A	63,137	862,614	287,338	209,829	A	0	851,557	315,902	255,459
B	1,750	66,979	668	963	B	0	6,088	2,444	61,828
C	9,951	120,207	3,436	9,680	C	0	81,961	12,566	48,747
D	32,180	397,921	37,333	43,535	D	0	203,094	94,120	213,755

Alternative W

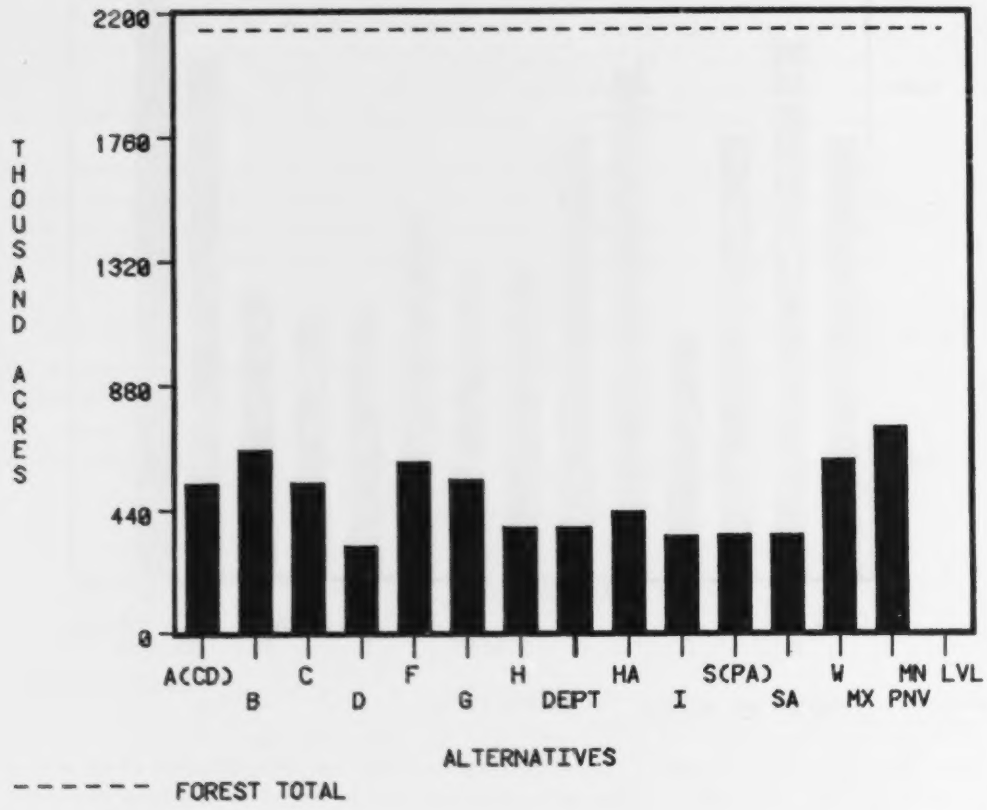
Energy					Non-Energy				
Access Category	Low	Mod	High	Very High	Access Category	Low	Mod	High	Very High
A	52,376	412,096	24,888	0	A	0	302,836	96,539	89,985
B	1,561	96,707	2,122	3,225	B	0	21,250	13,544	68,821
C	38,890	510,721	152,161	142,566	C	0	439,814	180,458	224,066
D	14,191	428,197	149,604	118,216	D	0	378,800	134,491	196,917

Alternative S

Energy					Non-Energy				
Access Category	Low	Mod	High	Very High	Access Category	Low	Mod	High	Very High
A	34,914	287,644	26,896	120	A	0	225,705	62,364	61,505
B	33,902	257,180	9,106	91,747	B	0	118,759	81,595	191,581
C	27,669	465,010	175,570	134,461	C	0	472,248	182,061	148,481
D	10,533	437,887	117,203	37,679	D	0	325,988	99,012	178,222

Figure II-24

ACRES ROADED BY DECADE 5



11. **Road System**

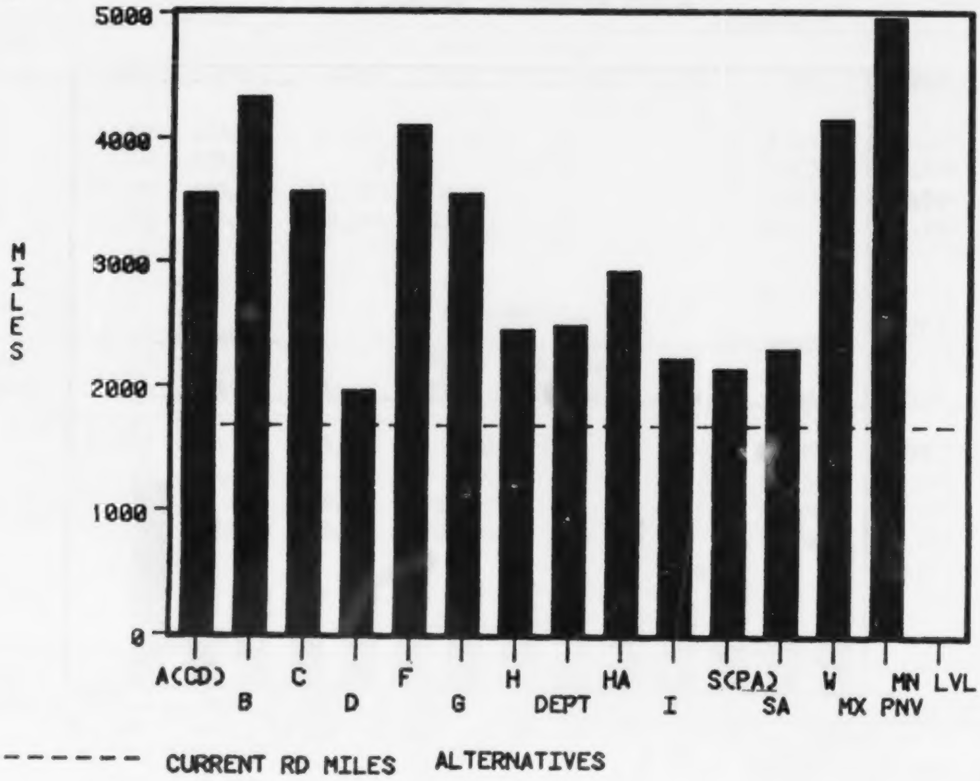
Approximately 1,685 miles of road exist on the Forest, including 585 miles of arterial and collector roads, and 1,100 miles of local road, used mainly to access timber for harvest.

The projected total miles of additional roading needed to complete the Forest transportation system is displayed in Figure II-25. The amount of road necessary depends largely on the amount of area assigned timber prescriptions, and the yarding systems scheduled. It is assumed that all arterial and collector roads will be constructed, and all general areas assigned timber prescriptions will be accessed within the first five decades. The remainder of the local roads needed to complete the system will be constructed in the first ten decades.

The Forest will continue a program of obtaining right-of-way access across other ownerships outside the Forest boundry. Right-of-way acquisitions will mostly be obtained to provide access for planned resource development.

ROAD CONSTRUCTION (ADDITIONAL ROADS NEEDED FOR MANAGEMENT)

Figure II-25



None of the alternatives provide less public access to the Forest than is currently available. However, each alternative will require implementation of a road management plan that protects public safety, soil and water resources, and meets management objectives through the use of seasonal and yearlong road and area closures or access restrictions. In no alternative will all roads remain open for public use. Generally, seventy-five percent of all newly constructed roads will be closed to public use in the fall to provide security for elk.

12. **Fire Management**

Timber harvest with associated slash disposal provides break in continuous fuels which aid in the prevention and supression of wild fire. Alternatives with higher amounts of timber harvest and larger regulated timber bases provide more of these breaks and reduce the probability of large catastrophic fires.

Wilderness areas on the Forest have been or are being evaluated for application of fire management prescriptions. Prescriptions prepared for the Anaconda-Pintler Wilderness range from immediate control in areas where public safety or other resource values are important, to monitoring only where desirable to restore fire to the ecosystem. Alternatives vary in the application of fire management prescriptions by the amount of land designated wilderness.

13. **Energy Consumption**

Energy consumption for each alternative was ascertained by multiplying Regional coefficients of energy use for various activities times 6 variable factors. Dispersed recreation factors varied by recreation visitor day use and included energy expended by the user from home to recreation area or site.

Energy consumption was calculated for dispersed recreation, timber management, and road construction (Table II-15). The higher the timber output, the greater the energy consumption because recreation uses vary only slightly among alternatives and other uses vary directly with timber harvest volume.

Table II-15
Decade 1 Annual Average Energy Consumption
(million BTU's)

	Alternative/Benchmark														
	A	B	C	D	F	G	H	DEPT	HA	I	S	Sa	W	MAX PNV	MIN LVL
Road Construction															
Local	25	31	25	14	29	25	17	20	21	17	15	18	40	36	0
Collector	.3	.3	.3	.1	.3	.3	.3	.3	.3	.1	.3	.3	.3	.3	0
Dispersed Recreation	155	155	155	155	155	155	155	155	155	155	155	155	155	155	155
Timber															
Harvest	24	28	21	16	30	36	17	26	19	23	14	15	31	46	0
Stand Exam	3	27	27	20	16	36	17	17	17	20	17	17	16	20	0
Reforestation	5.6	6.0	6.5	6.2	3.1	5.9	3.7	5.7	6.7	1.6	4.7	4.8	2.9	3.3	0

14. Issues Considered in Alternatives

The alternatives were designed to respond in various ways to the seven major issues. A summary of indicators of response to issues appears in Table II-4 and in Appendix B, Table B-15.

15. Economic Impacts in the Beaverhead National Forest's Area of Influence

Changes in timber harvest, recreation use, livestock grazing, and Forest Service expenditures on the Beaverhead National Forest result in changes in personal income and employment in Beaverhead, Madison, and to lesser extents Silverbow and Deer Lodge Counties. Total employment for the four counties in 1980 was approximately 26,000 jobs. Within the four-county area, Forest activities in 1980-1982 accounted for 914 jobs and $15.7 million in personal income. The relative contribution of employment and income to the two-county area by alternative are displayed in Figure II-26. Differences among alternatives in employment and income are primarily due to changes in timber harvest levels, available AUM's of forage, and Forest expenditures. Total employment and income increase in all alternatives from that associated with National Forest management in 1980-1982. This is in part due to increased Forest expenditures and, depending upon the alternative, also due to increases in permitted grazing use and timber harvest objectives. In all alternatives after the first decade employment and income increase, contributing over time to the economic stability of the area.

The employment and income values include direct, indirect, and induced effects on private sector industries, ranchers, loggers and other nongovernment sectors in the local economy.

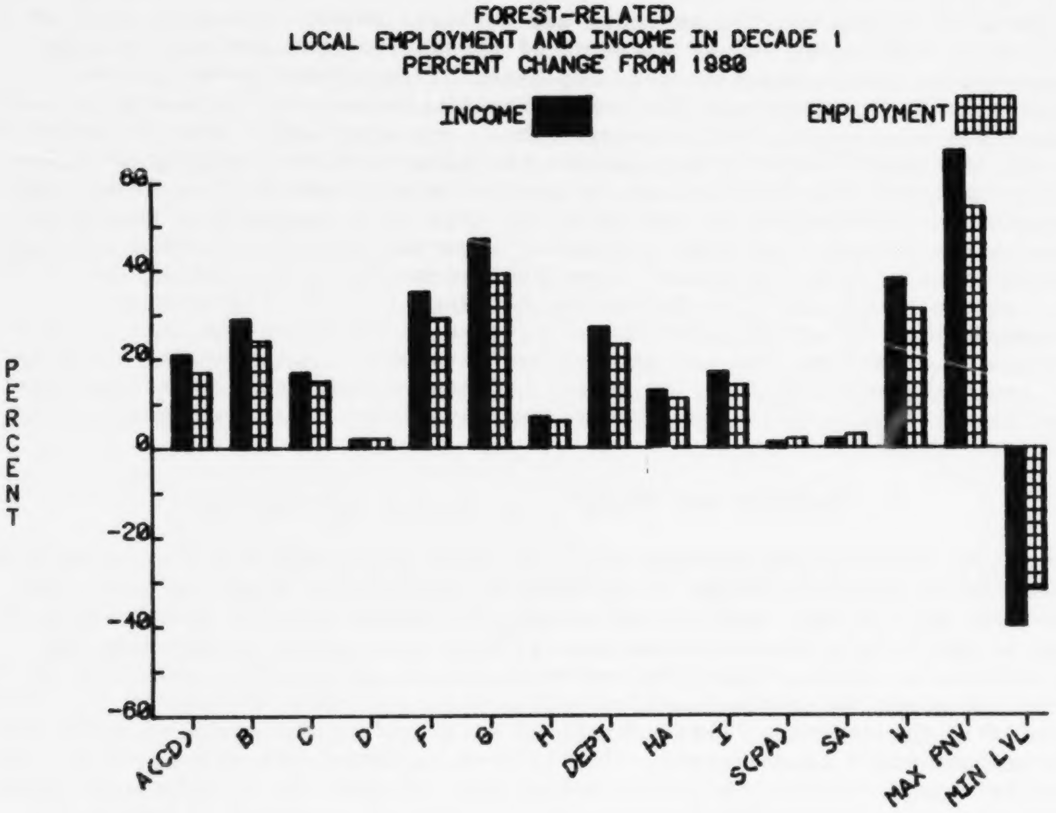
16. Social Effects in Beaverhead and Madison Counties

While employment and income are important in determining an individual's quality of life, amenity values like scenery, hunting, fishing, backpacking, and fuelwood gathering are also important. The effects of Forest resource use on these latter activities are less quantifiable than employment or income estimates; however, they are important to the lifestyles of local residents.

Six social variables--1) sense of control and self-sufficiency, 2) feelings of certainty or uncertainty, 3) community cohesion and stability, 4) population change and feelings of crowding, 5) lifestyle and job dependence, and 6) symbolic meaning of the National Forest--are used to compare the effects generated by Forest outputs and activities on eight broad social groups (see Appendix B, section V). These groups have been identified as most likely to be affected by the different management objectives expressed by the alternatives. These groups are not mutually exclusive since people can belong to several groups. They are, however, categories useful for this analysis.

Comparisons are made to the current situation represented by Alternative A (Current Level Management).

Figure II-26



FOREST-RELATED
LOCAL EMPLOYMENT AND INCOME IN DECADE 1
PERCENT CHANGE FROM 1980

a. Younger Newcomers

Younger newcomers tend to relate strongly to and benefit from those alternatives which limit the activities related to resource development. In other words, alternatives that permit a high level of timber harvest, grazing activities, and mineral development are generally less desirable than alternatives that preserve the natural setting of the National Forest and maintain as many options for the future as possible. Younger newcomers are similar to the other social groups in that they want to ensure the certainty of their future in the area; however often that future is linked to noncommodity type resources. In addition, they generally want to ensure that the environmental factors that drew them to this area do not change significantly in the future, degrading the quality of their environment as they perceive it. In a similar vein, younger newcomers, attracted to the area because of the existing social environment and low population levels, are opposed to any alternatives for National Forest management that would lead to population increases resulting in a more crowded environment or to a lessening of community cohesion. If any people move into the area, the younger newcomers would like more people like themselves, advocates of a low level of development for National Forest lands and resources.

b. Millworkers and Laborers

This group is a diverse one, with people of varied backgrounds working together. Generally, people in this category use National Forest resources, both as a source of employment and as a source of recreation, but the use tends to be more consumptive than contemplative. Employees of the timber industry are particularly interested in the use of the timber resource necessary to maintain their position within the industry. Thus, any alternative that decreased the level of timber harvest scheduled for the Beaverhead National Forest below the existing level would be opposed and generally increased harvest levels would be supported. Maintenance of certainty for this group encompasses maintenance of employment security and even increasing opportunities (for example, through development of mineral resources) as well as maintaining existing opportunities for access to the National Forest for hunting, fishing, firewood cutting, snowmobiling, and so on. The symbolic value of the Forest is that it is a source of resources that can be used and developed. Alternatives which provide at least the existing level of access and development would therefore more positively impact this group than alternatives that decrease opportunities to use resources.

c. Ranchers and Farmers

Generally ranchers and farmers are interested in maintaining their traditional lifestyles, difficult to do in this day of high taxes, high overhead costs, and unstable prices for livestock and crops. Pressures to sell or subdivide have led to new owners in areas adjacent to families involved in ranching for generations. Still, often the newcomers try to emulate the traditions of the area. For active ranchers, alternatives which increase the amount of forage available for domestic livestock use or which reduce the costs of livestock management would be preferred. In addition, alternatives which provide the greatest opportunities for motorized access, whether for livestock management or for recreation are preferred, in that the time of a rancher is precious. However, alternatives which greatly change the existing environment through extensive timber or mineral development would not be supported because these will lead to changes in the ranching community's opportunities to maintain a traditional lifestyle. Increased population, higher land values, changes in land use patterns--generally these are perceived as adverse impacts.

While maintaining at least the current level of permitted livestock grazing on the Forest, additional constraints will be placed on permitted grazing use through allotment management planning. These constraints are designed to protect riparian area vegetation for maintenence of fisheries and water quality, maintenence of wildlife forage on important winter ranges, and to reduce conflicts with other Forest resources. Reducing these conflicts and managing for constraints without the overall loss of permitted grazing will require investment in range improvements, cooperation with permittees, and will likely increase the general costs of management for both the Forest and the permittee at least in the short term.

d. Loggers

The logging category is similar to the millworkers/laborers group in that a logger's livelihood and lifestyle is closely linked to National Forest resources. Generally loggers are concerned about maintaining local control for decision making and economic stability for the community, especially as that relates to the timber industry. Alternatives which promote timber harvest and vigorous growth of new trees would be beneficial to this segment of the population. The level of timber harvest scheduled in each alternative is dependent on a number of factors including the amount of proposed wilderness and roadless lands set aside for nondevelopmental uses such as recreation and constraints placed on harvesting to protect other resources such as wildlife, water quality and fisheries. Alternatives which propose lower levels of harvest than the current level will require a greater dependence of the industry on private and off-Forest sources of stumpage to maintain current opperations. A decrease in the current harvest level would be opposed. Alternatives which maintain higher levels of access and availability of opportunities for hunting, fishing, motorized recreational use of the Forest and so on would be preferred.

e. Business Community

Generally, the business community believes that population increases and resulting increases in business depend upon increasing levels of commodity production in the area that is long term and stable. While production of commodity resources does not have to occur on National Forest land to benefit the community, management alternatives which promote production and use of forage, timber, mineral exploration and development and to lesser extents recreation opportunities would be supported. The latter category--recreation--would be promoted so long as it did not dampen production opportunities in the other areas. However, the business community is diverse enough so that some would be benefited by more recreation oriented alternatives, while others would be positively affected by alternatives which increase commodity outputs. Population growth would be supported so long as a boom and bust situation did not develop.

f. Miners

Miners are more accustomed to uncertainty and economic instability than the other social groups identified here; however, undoubtedly they would be supportive of alternatives that enhanced community stability and reduced the uncertainty in their lives. Generally, miners approach resource management from more of a consumptive viewpoint than from a preservationist viewpoint. They would favor alternatives that were least restrictive on motorized access and most open with minimal restrictions on mineral exploration and development. Thus, alternatives with large acreages proposed for wilderness classification and alternatives with prescriptions that protect wildlife habitat through access restrictions would generally be opposed. Although miners support mineral development often they are not in favor of the population increases and perceived crowding that can be associated with it. They utilize the National Foerst for recreation opportunities (generally activities such as hunting and fishing) and so would generally be supportive of alternatives that maintain opportunities to pursue these activities.

g. Government Workers and Educators

Generally this population is relatively stable and would change little regardless of the management alternative implemented unless that alternative significantly lowered production of key commodity resources such as timber. Management is approached generally from a middle of the road to more conservationist perspective. The members of this social category are generally most interested in protection of resources, not necessarily opposing development so long as long-term resource values are protected and maintained for future generations. Members of this group are concerned that community cohesion be maintained or enhanced and so would be supportive of alternatives that tried to provide adequate levels of resource use opportunities to meet the broad spectrum of needs found in the community. The Forest is perceived to be a source of multiple resources, all of which need to be managed and protected.

h. Retirees

Generally, retirees prefer alternatives which stress maintaining the Forest in a natural setting, with adequate motorized access provided so that they can pursue the variety of recreation activities that are their primary use of the National Forest. Alternatives which fully promote commodity production to the detriment of amenity or recreational values would cause a shift in the population, with more younger people moving in. Community cohesion and perceptions of desirable population levels would be impacted, adversely from the perspective of most retirees. Many retirees would see this area as a less desirable place for retirement and could move.

i. Women and Minorities

It is difficult to segregate the effects of Forest management activities on these categories of people. The social effects are expected to affect these groups approximately in the same way as other people in the common categories within which they are included.

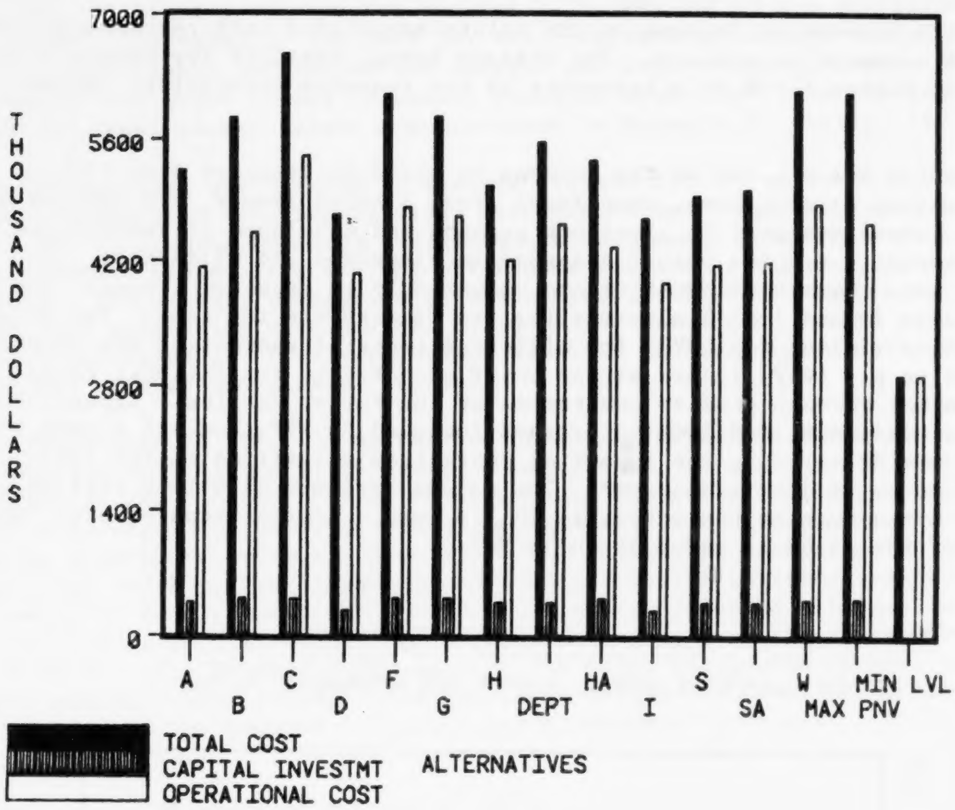
17. Significant Economic Comparisons Among Alternatives

This section explains the significant tradeoffs that would occur among the quantified economic benefits and resource outputs. Major categories for discussion are dollar costs, dollar benefits (market and nonmarket), and the interrelationship between the two (Present Net Value).

a. Costs

The annual costs for Decade 1 by alternative are displayed in Figure II-27 by two cost categories: capital investment and operational. Capital investment costs are primarily associated with road construction. Operational costs are all other costs associated with management of the National Forest. The annual operational costs for all alternatives are higher than the average 1980-1982 expenditure level of $3.3 million (expressed in 1978 dollars). The annual costs by the major resource group for decade one, and projected for decades 3, 5, 10, and 15 are displayed in Table II-20.

Figure II-27 DECADE 1-AVERAGE ANNUAL COSTS



The discounted costs for 150 years by major resource group by alternative are displayed in Table II-20. The discounted cost is the sum of all expenditures for 150 years discounted at 4 percent. The minimum discounted cost for Federal ownership of the Forest is $72 million as defined by the minimum level benchmark.

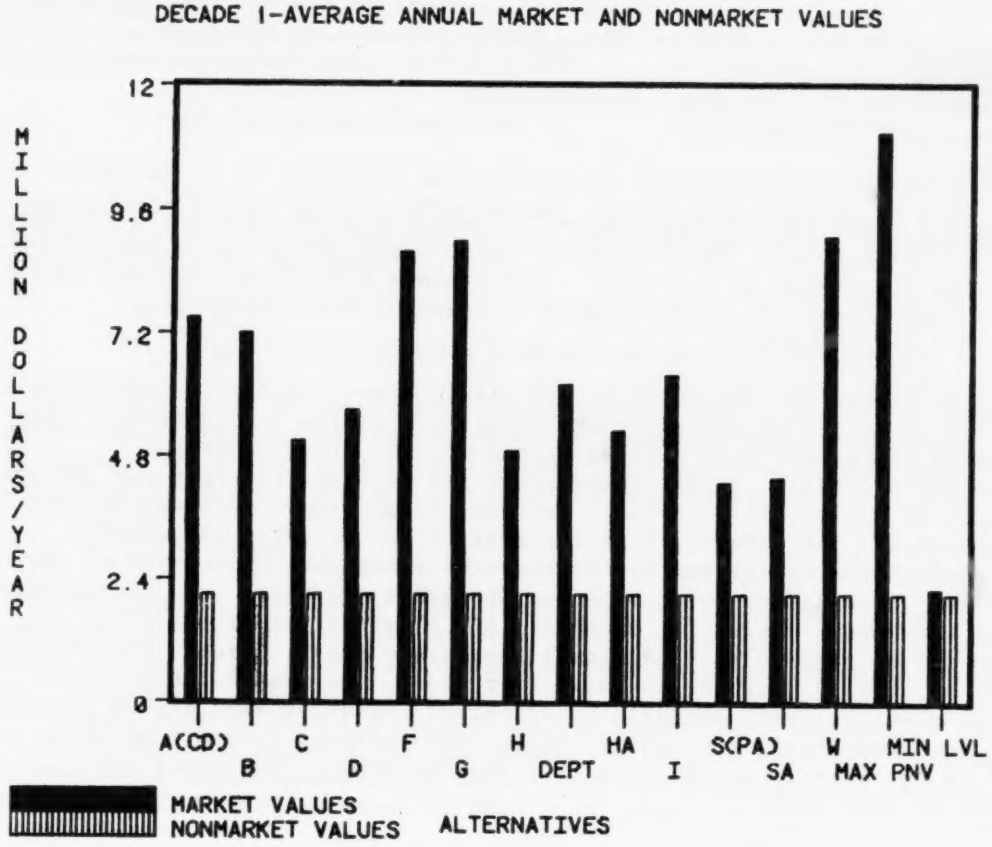
Roughly fifty percent of the costs in all alternatives are for activities which are not significantly influenced by the objectives of the alternatives. They are the costs associated with minimal maintenance of investments and administration of federal lands. These costs are $2.9 million/year and include general administration, fire control, maintenance of range improvements, and road maintenance. The other half of the cost is for resource management activities which are determined by the resource management objectives of the alternatives. Alternatives with emphasis on market resources have higher road and timber management costs, for example. All alternatives have similar recreation costs, particularly developed recreation costs, because recreation management is ongoing whatever the mix of proposed land uses for the Forest. However, alternatives with emphasis on nonmarket resources have higher wildlife costs and somewhat higher recreation costs. After decade 5, costs would be projected to decrease in all alternatives because most of the roads are constructed by that time.

b. Priced Benefits

This benefits discussion focuses on the values associated with resource outputs that can be measured in dollars. The average annual benefits for Decade 1 are displayed in Figure II-28 by alternative by two resource categories: market and nonmarket.

Market benefits are the sum of the returns to the U.S. Treasury from timber sales, livestock grazing fees, campground fees, mineral leases, and special use fees, plus values assigned to livestock grazing and developed recreation use. Nonmarket benefits are the values assigned to dispersed and wilderness recreation use. Nonmarket benefits are valued only to expected demand. Since supply exceeds demand in all alternatives the figures are the same. The values per recreation visitor day (RVD) for different types of recreation are based on willingness to pay (WTP) values at the point of entry to the National Forest and were determined through studies contracted by the Forest Service. Expenditures for travel, equipment, and lodging are not included in WTP, but are a part of the impact analysis, i.e., the impact of recreation activities on the local economy in terms of jobs and income. The values assigned livestock grazing and recreation use recognize the potential dollar return to the taxpayer even though only part of the price is actually collected.

Figure II-28



The annual benefit by the two resource groups and by individual resources for decade one and those projected for decades 3, 5, 10, and 15 are displayed in Table II-20. The benefits increase for all alternatives through the planning period as both timber and recreation outputs and unit prices increase. The differences that might result in market benefits associated with changes in assumptions about timber values are discussed in Appendix B, Section IV.

Discounted benefits are the sum of assigned values for 150 years discounted at 4 percent. Discounted benefits by major resource category are displayed in Table II-20. The discounted benefits incidental to management activities occurring on National Forest System land are $81 million as defined by the minimum level benchmark. The primary categories of discounted incidental benefits are: $68 million from recreation use, and $13 million from livestock grazing permits currently outstanding. Additional minor benefits are associated with existing special use permits and mineral leases.

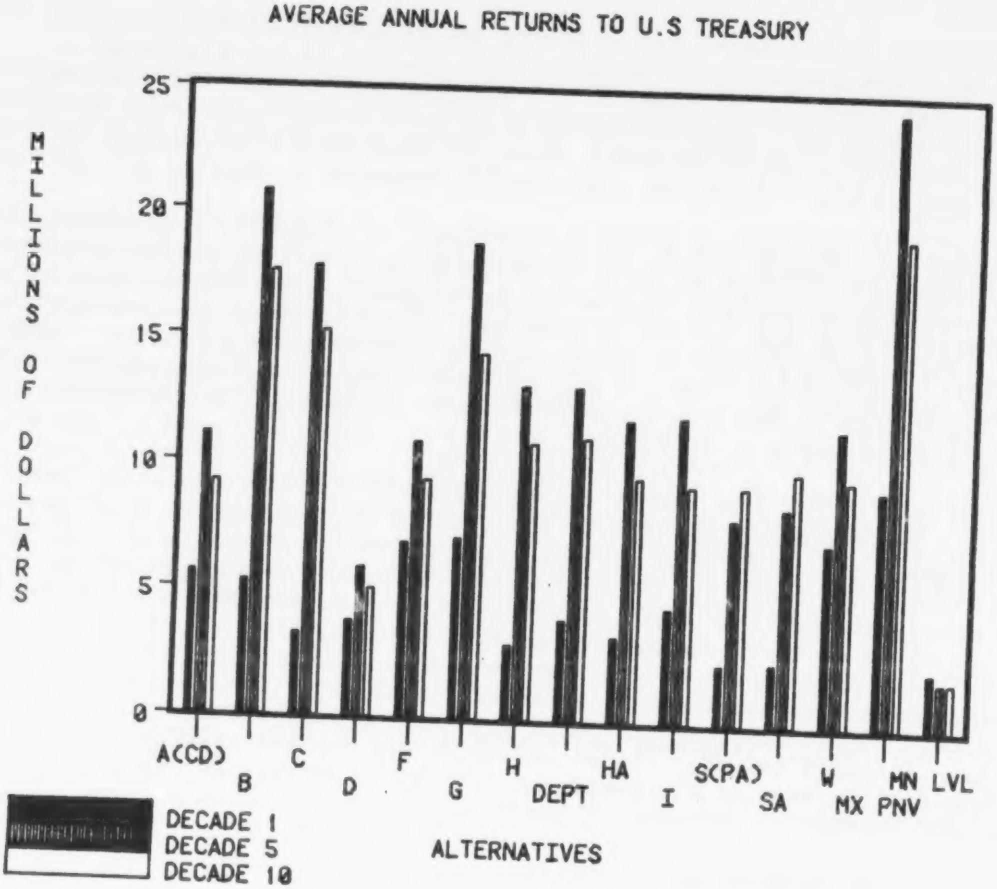
The contributions to PNV from market and nonmarket values in the minimum level benchmark are split about fifty-fifty. However, in the maximum PNV benchmark, the market values contribute four to five times the dollars associated with the nonmarket values. In comparing the alternatives, values assigned to market resources contribute twice to three times the discounted benefit value in alternatives which emphasize market resource production (Alternatives B, and G for example). In Alternative D, the most nonmarket oriented alternative, the market and nonmarket resouces each contribute roughly half the discounted benefit value. The primary difference in the total discounted benefit value of alternatives is timber values. The nonmarket values are essentially the same for all alternatives because dispersed and wilderness recreation use is essentially the same.

1. Returns to the Treasury

The portion of the market benefits which are actual returns to the U.S. Treasury are displayed in Figure II-29 for Decades 1, 3, and 5. Returns result primarily from the sale of timber, and secondly from the domestic livestock grazing permits. Other returns are campground fees and special uses fees and are estimated at less than $19,000/year in all alternatives. In addition, mineral lease fees return dollars to the Federal Treasury. These were not included in the calculations due to the uncertainty of the oil and gas future for the area. Still, one can assume that leased lands will return at least 10 dollars per decade per acre, and the more lands leased the greater the federal revenues. Withdrawal of an area due to wilderness classification will reduce potential revenues from leasing on the Forest.

Generally returns are projected to increase in all alternatives because of real stumpage price increases through the fifth decade and because the timber harvest level would increase through the fifth decade if implementation of the alternative was continued fifty years out. The differences in returns among alternatives are due to differences in the value and amount of timber harvest and to differences in the number of AUM's permitted. The annual returns by resource for decades 1, 3, 5, 10,and 15 are displayed in Table II-20.

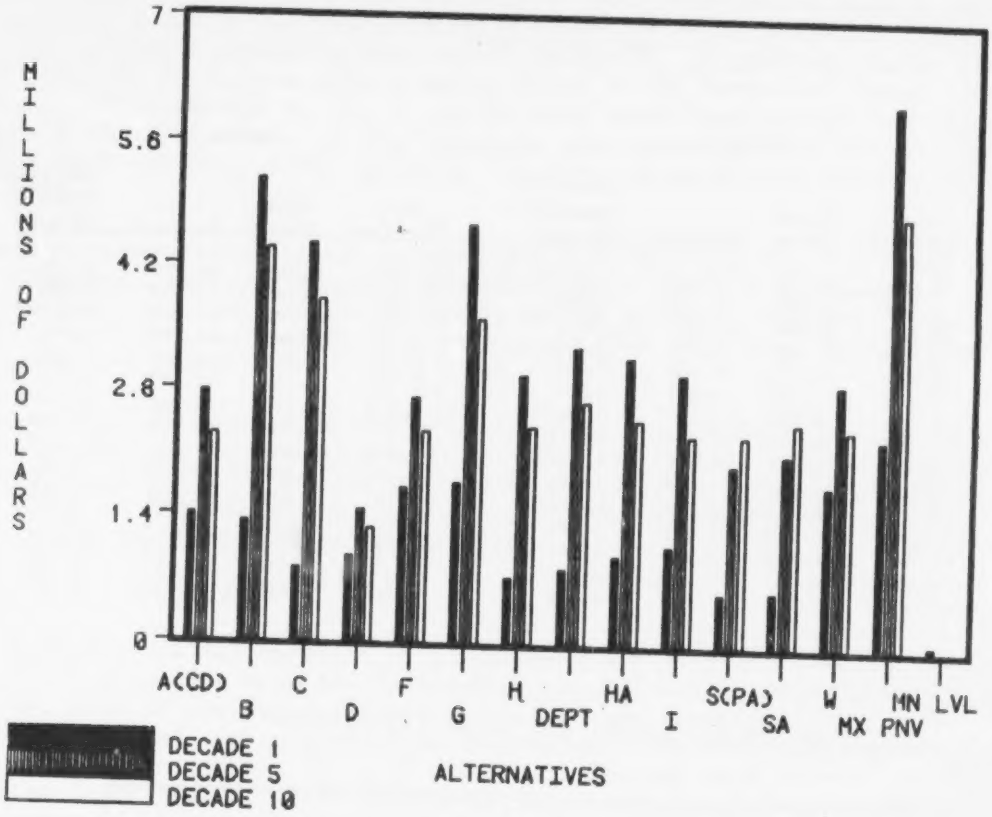
Figure II-29



2. Returns to the States

Twenty-five percent of the returns to the U.S. Treasury are distributed to state and local governments for road and school operations. The annual returns to local governments are displayed in Figure II-30 for decades 1, 3, and 5 and the annual returns to state and local governments are displayed in Table II-20 for decades 1, 3, 5, 10, and 15. The distribution of the returns is based on the area of Forest land in each county: 64 percent to Beaverhead County, Montana; 29 percent to Madison County, Montana; 6 percent to Deer Lodge County, Montana, and less than 2 percent to Silverbow County, Montana. Returns to state and local governments in the first decade for all alternatives are higher than the 1980-1982 average returns.

Figure II-30 AVERAGE ANNUAL RETURNS TO STATES



3. U.S. Treasury Cash Flows and Non-cash Benefits

Net cash flows to the U.S. Treasury are the dollar returns to the treasury less the total budget costs. Table II-16 displays the net cash flow to the U.S. Treasury for each alternative in order of declining PNV for the first and fifth decades. Returns exceed agency expenditures for all alternatives in decade five, but in decade one, only Alternatives A (Current Direction), G, and W have returns exceeding projected expenditures. Alternative C has expenditures exceeding returns to the greatest degree. While the benefits displayed in Figures II-29 and II-31 estimate the full, potential, discounted dollar returns to the U.S. Treasury and taxpayers if full charges were made, the focus here is limited to the actual net receipts collected under current laws and policies. Cash receipts include returns from timber sales, livestock grazing fees, campground fees, mineral permits, and special use fees.

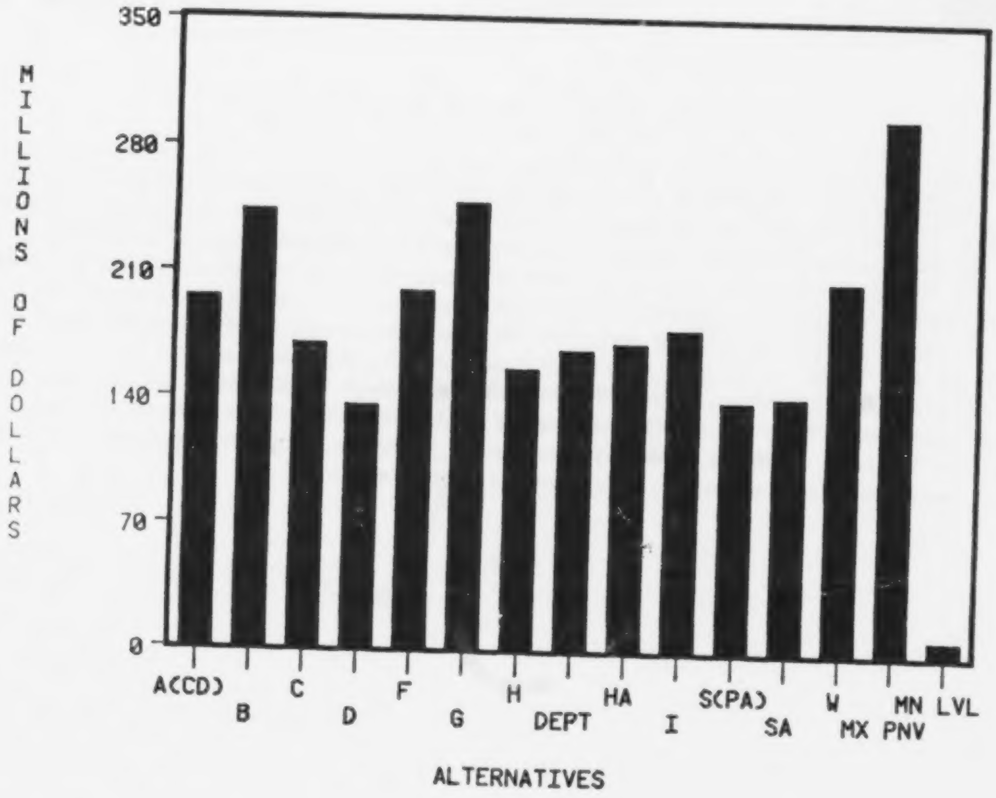
Table II-16

Average Annual Net Returns to the U.S. Treasury
(Million Dollars)

	Decade 1				Decade 5			
Alternative/ Benchmark	Net Receipts	Total Costs	Receipts	Non-Cash Benefits To User	Net Receipts	Total Costs	Receipts	Non-Cash Benefits To User
Max PNV	3.209	6.135	9.344	0.045	18.173	6.247	24.420	0.051
G	1.260	5.862	7.122	0.045	12.977	5.781	18.758	0.049
B	-0.523	5.850	5.327	0.046	13.782	6.996	20.778	0.050
W	1.039	6.163	7.202	0.048	5.846	5.866	11.719	0.051
F	-2.223	6.113	6.890	0.047	5.066	5.821	10.887	0.050
A	0.418	5.246	5.664	0.047	5.797	5.344	11.141	0.051
I	-0.184	4.705	4.521	0.044	7.270	4.816	12.082	0.047
H(Dept)	-1.398	5.573	4.175	0.049	6.782	6.125	12.907	0.050
C	-3.266	6.566	3.300	0.047	10.474	7.350	17.824	0.052
HA	-2.000	5.368	3.368	0.048	7.074	6.096	13.170	0.051
H	-2.123	5.079	2.956	0.049	6.252	5.677	11.929	0.053
Sa	-2.554	5.030	2.476	0.048	3.177	5.375	8.552	0.049
S(PA)	-2.582	4.965	2.383	0.047	2.787	5.283	8.070	0.049
D	-0.887	4.737	3.850	0.047	1.313	4.604	5.917	0.048
Min Level	-2.713	2.938	.225	0.036	-2.864	2.883	.019	0.000

Figure II-31

COMPARISON OF PRESENT NET VALUE (4% DISCOUNT)



Timber receipts comprise the bulk of the total receipts as displayed in Table II-20 (about 95 percent). The variance in total receipts between alternatives is primarily due to the timber harvest level. Alternatives with higher timber harvest programs generally have higher receipts. In addition timber receipts are affected by the per unit stumpage value of the harvested timber. For example, Alternatives H, HA, S, and SA have lower receipts because the harvest program is focused more on the lodgepole pine stands, a species with much lower value than the Douglas-fir on which the other alternatives concentrate the harvest.

Range receipts vary slightly between alternatives, with the low being in Alternative I (which recommends over half the Forest for wilderness classification, limiting the intensity of the grazing program). Grazing AUM's vary but not to any extreme between alternatives therefore the differences in receipts are slight.

Non-cash benefits refer to the benefits individual resource users receive who are charged less for the resource than they are willing to pay. In other words, the non-cash benefits are the difference between the full economic value of the resource and the fees actually paid to use that resource. Alternatives vary in the amount of non-cash benefits provided.

c. **Budget**

The annual costs for Decade 1 by alternative are displayed in Figure II-31 by two cost categories--capital investment and operations and maintenance. On the Forest, most of the capital investment costs are associated with road construction and timber management activities. There is some capital investment forecast for recreation facility reconstruction and road access. In addition, capital investment finances administration site rehabilitation. For a detailed breakdown of cost categories see Appendix B, Section IV. The annual budget costs for all alternatives are higher than the average 1980-1983 expenditure level. The annual costs by the major cost categories are displayed for decades 1,3,5,10, and 15 in Table II-20.

d. **Comparisons of Benefits and Costs**

Three measures of economic consequences compare the benefits and costs of the alternatives: net returns, total costs, and present net value.

Net returns are the returns to the U.S. Treasury less the total costs and represent the cash flow to the U.S. Treasury. In Alternatives B, C, D, H, HA, the departure analysis, S, SA, and I the total costs exceed returns in decade one. For all alternatives except D the returns exceed costs by decade 3. By decade 5, all alternatives have returns that exceed total costs.

The primary measure of economic efficiency (net priced benefits) is present net value (PNV). This is the sum of the market and assigned values for timber sales, livestock grazing permits, recreation use, and mineral leases less all management costs for 150 years discounted at 4 percent. Figure II-32 displays the discounted benefits and the discounted costs by alternative. The PNV of the alternatives is displayed in Table II-20 and Figure II-33.

Figure II-32

DISCOUNTED BENEFITS AND COSTS

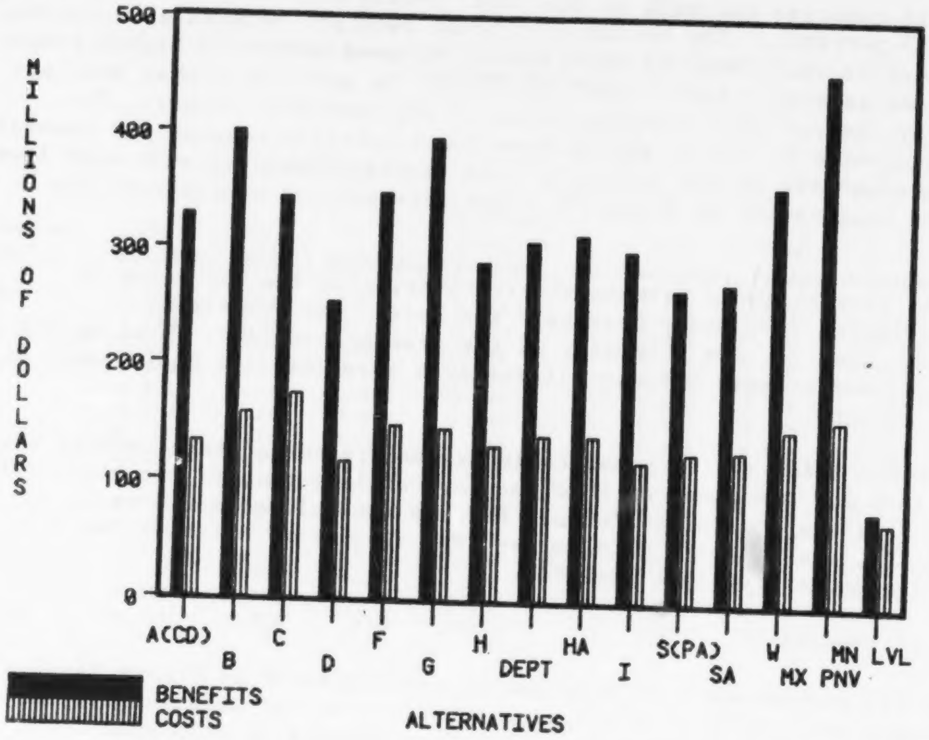
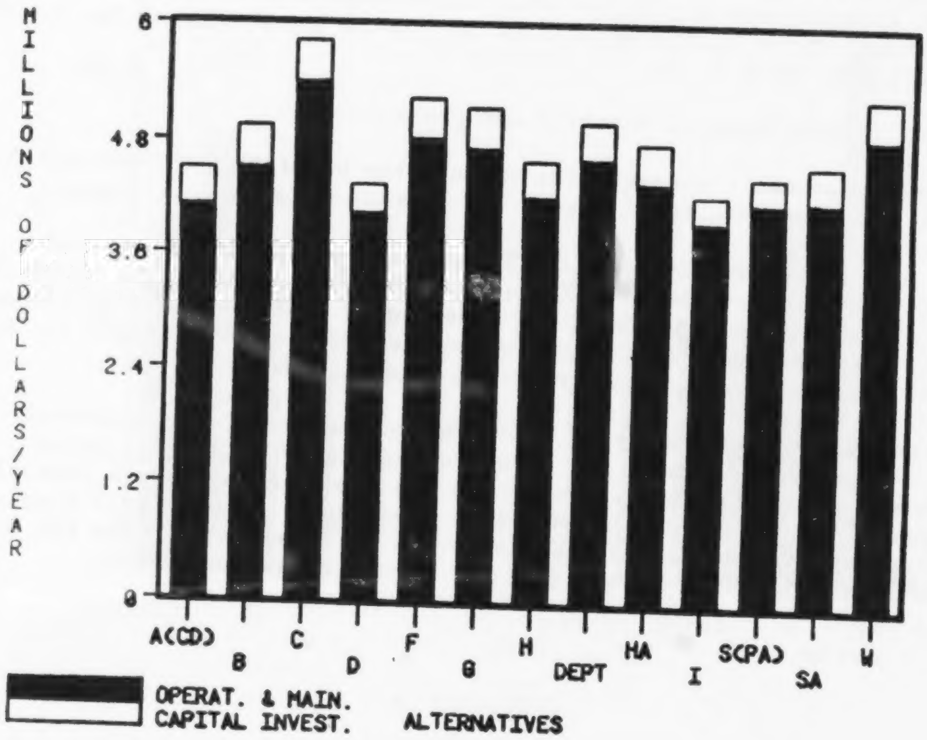


Figure II-33

AVERAGE 1ST DECADE BUDGET OPERATIONS & MAINTENANCE PLUS CAPITAL INVEST.



The maximum PNV of the Forest is $298 million as defined by the maximum PNV benchmark. The PNV benchmark represents the maximum net return available from managing the Forest. Although it meets minimum legal requirements of managing the Forest, the PNV benchmark is not designed to address issues.

Most of the change in PNV among alternatives is due to changes in the net value of the timber resource. In general, PNV increases with the size of the suitable timber land base and with the amount of scheduled timber harvest. Alternatives with large suitable land bases have the flexibility to maximize the benefit/cost ratio associated with the timber management program. To a lesser extent, changes in PNV are due to changes in range benefits and costs. The benefits and costs of other programs such as recreation are fairly constant among alternatives.

The alternatives are ranked by present net value in Table II-17, where present net value is defined to be the difference between the discounted benefits and the discounted costs of each alternative. The second column in Table II-17 shows the differences in PNV among pairs of alternatives. These figures are estimates of the net economic values that would be foregone if a lower-ranked alternative rather than the preceeding one were selected. Because timber values are the major component of PNV, these potentially foregone values are largely due to limiting the timber program. As the timber program and PNV decrease, costs are also generally decreased, although at a slower rate. The alternative that emphasizes nonmarket resources has a PNV that is 63 percent of the PNV for the alternative that emphasizes market resources; but its costs are 74 percent of those for the market alternative. Even though less timber is harvested, other resource goals increase costs due to mitigation measures. In addition, there is the cost associated with the nontimber resources that may not have changed between the two alternatives.

The high costs of Alternatives H, HA, S, SA and D relative to the economic values they provide are due to their emphasis on responding to issues in ways that produce relatively few values that can be expressed in numeric terms. For example, these alternatives emphasize distributing the harvest throughout the suitable timber base and on harvesting the lodgepole pine stands with high risk of mountain pine beetle infestation. These management values reduce the dollar returns that could occur if only economics were used in the decision.

Table II-18 shows discounted benefits and costs by resource group. This table shows that timber values make up the majority of the PNV values on the Beaverhead National Forest. Most of the change in PNV among alternatives is due to changes in the management of the timber resource. In some alternatives, the benefits associated with the recreation resource assume a major role in determination of PNV. The range resource plays still less important a role. Discounted timber benefits for the planning horizon are in excess of the discounted timber costs. This means that overall, the timber program is financially viable. Appendix B, Section IV,B,3,a discusses the relationship between discounted timber benefits and costs if different assumptions about timber values, current and future, are made.

Table II-17

Present Net Value, Discounted Costs, and Benefits and Benefit/Cost Indices (Million $)

Alternative/Benchmark	PNV	Change	Discounted Costs	Change	Discounted Benefits	Change
Max PNV	298		158		456	
Alternative G	249	-49	146	-12	396	-60
Alternative B	244	-5	158	+12	401	+5
Alternative W	207	-37	149	-9	357	-44
Alternative F	200	-7	148	-1	348	-9
Alternative A	196	-4	133	-15	329	-19
Alternative I	180	-16	120	-13	300	-29
Alternative H (Dept)	172	-8	141	+21	313	+13
Alternative C	170	-2	174	+33	344	+31
Alternative H(A)	168	-2	139	-35	307	-37
Alternative H	157	-11	132	-7	289	-18
Alternative S(A)	143	-14	130	-2	273	-16
Alternative S	140	-3	128	-2	267	-6
Alternative D	136	-4	117	-11	253	-14

Table II-18

Discounted Benefits and Costs for Resource Groups (Million Dollars)

Alternative/ Benchmark	PNV	Discounted Benefits				Discounted Costs				
		Timber	Recreation	Range	Other	Timber	Roads	Recreation	Range	Other
Max PNV	298	309	106	41	0	36	31	7	8	76
G	249	249	106	42	0	30	23	7	8	79
B	244	253	106	42	0	36	27	7	8	80
W	207	208	106	42	0	25	26	7	8	83
F	200	200	106	42	0	25	26	7	8	83
A	196	181	106	42	0	23	23	7	8	72
I	180	154	106	39	0	17	15	7	8	74
H(Dept)	172	159	106	43	0	28	19	7	8	79
C	170	196	106	42	0	31	23	7	8	105
HA	168	159	106	42	0	26	20	7	8	79
H	157	140	106	42	0	22	17	7	8	78
SA	143	125	106	41	0	20	16	7	8	79
S(PA)	140	119	106	41	0	19	15	7	8	79
D	136	106	106	40	0	13	14	7	8	75
Min Level	9	0	68	13	0	0	0	7	2	76

Positive values do not mean that below cost sales have been avoided. Timber sales, whether below cost or not, were assessed in terms of how they fit into a comprehensive program of management for the Forest. The mix of outputs and associated costs and benefits produced by the different alternatives are the result of selecting prescriptions which most efficiently meet the objectives of an alternative. Cost efficiency was considered at several points; in the development of the prescriptions, and in the selections made within FORPLAN from an array of prescriptions available for assignment to an area (see Appendix B, Sections III and IV for more detailed discussions). In spite of alternative and prescription cost efficiency objectives; Table II-16 indicates in portrayal of negative returns for many of the alternatives in decade I that below cost sales will occur, particularly in the first decade of implementation. By decade 5 receipts do exceed costs. A recent research study indicates that efficient management and below cost sales are not necessarily incompatible and that analysis of timber management economics needs to have a broader temporal and spacial perspective than the individual timber sale (Schuster and Jones 1985).

18. Net Public Benefit and Nonpriced Benefits Addressed by the Alternatives Considered

The overall conceptual measure of value of each of the alternatives is net public benefit. Net public benefit is summarized here as a preface to discussing those benefits that cannot be expressed in economic terms.

Net public benefit is the overall long-term value to the Nation of all outputs and positive effects (called benefits) less all associated Forest inputs and negative effects (called costs) resulting from management of the Beaverhead National Forest. Many priced benefits and all financial costs of management can be measured in dollar terms. However, other nonpriced benefits and some negative effects cannot be measured quantitatively or cannot be fully valued in financial terms (see Appendix B, section IV,C). A major goal of Forest planning is to provide information that helps determine which alternative provides the mix that most closely responds effectively to issues, concerns, and opportunities, while maximizing the net public benefit of managing the National Forest.

Net public benefit is maximized by the alternative which has the greatest excess of benefits over costs. These benefits are expressed both quantitatively and qualitatively. The choice of the alternative that maximizes net public benefit is a subjective decision.

The principal benefits and costs relevant to making that judgement for the Beaverhead National Forest are associated with the issues discussed in Appendix A and with the legislation underlying the Forest planning process. Section 17 details the costs and benefits that can be measured in financial terms. Those benefits that cannot be quantified are discussed below. Section 18 then compares changes in economic benefits with differences in responses to the issues. Because these are summary statements, a fully informed judgement of the alternatives also requires an understanding of the results displayed elsewhere in this EIS.

The major nonpriced benefits are described in detail in Appendix B, Section IV,C and are presented here. Nonpriced benefits reflect issues that are not directly addressed by the alternative PNV comparisons. The resolution of these issues varies significantly by alternative and can be measured by physical indicators such as acres. As discussed above, more nonpriced outputs often result in reduced priced outputs (PNV). Table II-19 shows the tradeoffs between providing priced outputs and nonpriced outputs for major resources associated with the issues addressed in this planning process. Alternatives are listed in order of decreasing PNV in an attempt to show some trends between PNV and achievement of nonpriced resource management goals. The indicators are used to estimate the relative achievement of nonpriced resource goals among alternatives. The indicators do not fully quantify or place a value on the nonpriced benefits but they indicate differences in levels of nonpriced benefits between alternatives.

Although there are several nonpriced benefits resulting from Forest management, eight were identified as major benefits on the Beaverhead National Forest. These eight are generally directly or indirectly linked to the issues.

Table II-19

Indicators of Responsiveness of Alternatives to Major Issues and National Concerns

Alternatives/ Benchmarks	PNV MM$	Decade 1 Net Returns MM$	Decade 1 Non-Market Resource Benefits MM$	Decade 5 Net Returns MM$	Decade 5 Non-Market Resource Benefits MM$	Budget MM$	Decade 1 Domestic Livestock Grazing M AUM/YR	Decade 1 Base Timber Schedule MMBF/YR	Decade 1 LTSY MMBF/YR	Decade 1 Suitable Timber Land M Acres	Decade 1 Wilderness and Roadless Acres: Wilderness M Acres	Decade 1 Wilderness and Roadless Acres: Roadless M Acres	Decade 1 Roads Constructed Miles/YR	Decade 1 Fisheries Potential M Fish
Max PNV	298	3.209	2.111	18.173	5.224	5.075	180	55.4	51.9	730.6	173.5	989.0	72.1	
C	249	1.260	2.111	12.977	5.224	5.151	185	43.6	41.2	547.6	235.5	1051.3	53.3	335.1
B	244	-0.523	2.111	13.782	5.224	4.947	184	33.6	49.2	652.5	173.5	1044.9	63.5	334.8
W	207	1.039	2.111	5.846	5.224	5.282	195	37.6	35.7	615.8	488.8	784.0	61.0	334.0
F	200	-2.223	2.111	5.066	5.224	5.245	192	36.2	35.3	609.3	620.2	656.4	60.6	334.0
A	196	0.418	2.111	5.797	5.224	4.504	190	29.4	31.3	535.3	337.7	1000.4	52.4	334.0
I	180	-0.184	2.111	7.270	5.224	4.250	178	28.2	25.7	347.1	1415.6	173.5	33.2	337.8
H(Dept)	172	-1.398	2.111	6.782	5.224	5.006	199	31.6	40.2	378.5	337.3	1115.8	43.6	336.6
C	170	-3.266	2.111	10.474	5.224	5.822	182	25.8	42.3	537.2	1107.2	280.7	53.3	334.4
BA	168	-2.000	2.111	7.074	5.224	4.952	191	23.8	37.1	433.7	337.3	1060.6	45.0	336.6
H	157	-2.123	2.111	6.252	5.224	4.600	192	20.6	33.3	378.5	337.3	1115.8	37.8	337.8
SA	143	-2.554	2.111	3.177	5.224	4.581	189	18.1	34.5	360.3	342.9	1114.4	35.9	337.9
S(PA)	140	-2.582	2.111	2.787	5.224	4.550	190	17.3	32.1	338.3	342.9	1136.4	33.8	337.9
D	136	-0.887	2.111	1.313	5.224	4.342	186	18.8	18.6	313.1	945.9	670.0	29.7	337.1
Min Level	9	-2.713	2.111	-2.864	1.755	2.938	144	0.0	0.0	0.0	173.5	1544.0	0.0	

a) Big game hunting quality

Calculations of PNV include "willingness to pay" values for hunting recreation visitor days as a proportion of total recreation visitor days. However, priced benefits include only values for an average hunting quality experience. High quality hunting experiences, often encountered on the Beaverhead, are an important nonpriced output.

Big game hunting quality indicators include number and type of hunting permits granted, length of the hunting season, diversity of hunting experiences available, and opportunities for a successful hunt. The first two factors are influenced by the relative security of big game habitat. Two of the manageable factors influencing habitat security are road access and available hiding cover. Each of the alternatives was examined to determine its effect on these factors. In addition, each alternative was evaluated for diversity of hunting experiences available and the opportunities that would be available for a successful hunt in terms of elk population potentials.

The PNV tradeoffs associated with this nonpriced output result from costs associated with road management, assignment of potential winter range to winter range prescriptions, and scheduling adjustments for timber harvest necessary to ensure adequate maintenance of hiding cover.

b) **Water Quality**

Water quality is a nonpriced benefit that is linked to several other resources and resource uses on the Beaverhead Forest and downstream. Forest streams contribute directly to several municipal watersheds and to other domestic water systems. In addition, outfitter camps, resorts, summer homes, and public recreation sites on National Forest land utilize Forest water. Highly significant recreational and fisheries values are associated with Forest streams and rivers whose headwaters are located within the Beaverhead Forest. Ranchers who use water from National Forest lands for irrigation are also concerned about water quality. Water quality can be impacted by use of Forest resources, including livestock grazing, road construction associated with timber harvest, timber harvest, and extraction of minerals or oil and gas.

The indicators of water quality are the amount of sediment in streams and the potential catchable trout populations. Alternatives were designed to maintain water quality with the State of Montana management requirements as a floor.

Water quality generally decreases as timber harvest and road construction increase, but improves with increases in roadless recreation or wilderness recommendations, and with increases in wildlife constraints limiting the amount and distribution of timber harvest. PNV generally decreases as water quality increases because of the restrictions imposed on priced benefits such as timber. In every Alternative, timber harvest activities will not occur if State of Montana Water Quality Standards cannot be met.

c) **Roadless area management**

A major issue on the Beaverhead is how to manage approximately 1,246,000 acres of inventoried roadless areas, roughly 58 percent of the Forest. These areas are topographically and biologically diverse. While an average "willingness to pay" value has been assigned to dispersed and wilderness recreation opportunities, this value does not account for the total value of the exceptional quality of the wilderness and roadless resources on the National Forest. A variety of recreational activities have historically occurred in these areas. Some could continue with wilderness classification and others would not be allowed. These areas have value beyond their recreational uses; they provide wildlife habitat, function as biological reserves, serve as the headwaters for municipal watersheds or blue ribbon trout streams, and ensure that some areas of undeveloped country are maintained for future generations.

There are two primary components of this nonpriced benefit--wilderness management and roadless area management and the two are somewhat conflicting.

Indicators of this value are the acres assigned to both; acres to be recommended for wilderness classification and acres to be managed as unroaded with generally a wider array of resource uses permitted. Alternatives were designed to explore a full range of options for management of the roadless resource, ranging from full development to unroaded recreation to custodial management (essentially unroaded) to wilderness classification.

The impact of this nonpriced benefit on PNV is generally negative due to the reduction in suitable timberland and the increased costs associated with recreation management.

d) **Recreational settings--Quality and Diversity**

The calculations of PNV account for the number of dispersed recreation opportunities but do not address quality and diversity. Providing a wide range of settings varying in the level of development, user density, and mode of access ensures that the broadest segment of the public will find quality recreational experiences both now and in the future. Also, certain environmental settings have a high potential for providing quality recreational experiences. Certain landform types, vegetative types, scenery, water, and wildlife are factors that can contribute to the quality of the recreation setting. Finally, certain areas have long established historical uses that could be impacted depending upon the selected land use.

The alternatives were analyzed with respect to the quality and variety of the lands managed to provide recreation opportunities. Areas where public comments have indicated interest in maintaining a particular type of recreational opportunity were examined for each alternative. Areas of particular interest include the West Big Hole, West Pioneers, East Pioneers, Tobacco Root Mountains and Snowcrest Mountains. Each alternative was evaluated to assess its impacts on these areas.

e) **Visual Quality**

Visual quality refers to the range and distribution of the scenic aspects and perceived beauty and enjoyment of the Forest environment. Differences among alternatives are difficult to measure but real to Forest recreationists, local residents, and travelers who view the Forest from the highways. While the total numbers of recreationists in various settings with implied visual attributes have been estimated, the options available to view a visually pleasing Forest landscape have not been estimated. Visual management constrains timber management options, thereby contributing to increased costs and reduced PNV. Visual quality benefits are not included in PNV. Therefore, visual management objectives associated with the selected prescriptions for each alternative are evaluated in terms of their contribution to net public benefits. The more development scheduled for the Forest, notably timber harvest, the less are the visual quality benefits. On the other hand, wilderness and roadless acres contribute to visual quality by maintaining the existing visual resource.

f) **Mineral Activity**

Minerals were not assigned dollar values because there is currently no reliable method of predicting undiscovered mineral values. However, the Beaverhead is an area of high mineral interest for both energy and nonenergy minerals. Evidence of this is provided by the tripling of mineral receipts from 1981-1982 and by the amount of exploration activity presently occurring. Each alternative is evaluated in terms of the constraints imposed on access for mineral exploration and development, with consideration given to the favorability rating for specific areas.

g) Local Economic Stability

The value of maintaining or increasing local economic stability is not included in PNV. Maintenance of a sustained flow of Forest resources and uses to local communities decreases PNV because management options are decreased. In fact, the production of adequate levels of certain resources that contribute to the local economy may not be economically efficient.

Economic stability implies a dynamic, diverse, orderly, changing, and growing economy. The degree to which the production of goods and services associated with each alternative is responsive to the evolving local economy is assesssed in the calculations of this nonpriced value. The variety and volume of goods and services contribute to local economic stability and the indicator used to measure each alternative are impacts on the employment and income opportunities in the local, multicounty, impact area.

h) Lifestyles

The opportunities for local people to maintain existing and desired lifestyles are not valued as priced benefits or calculated in PNV but are considered in the determination of net subjective value. Local people depend on the Forest's resources in many ways; they have established relationships with the Beaverhead Forest. Thus the variety and quantity of resource uses available to people can impact their abilities to maintain a chosen lifestyle. Alternatives are evaluated in terms of the degree of shift that could occur in established land use patterns and relationships with National Forest resources.

19. Major Tradeoffs Among the Alternatives

Section 19 provides additional information to help identify the alternative or alternatives that come closest to maximizing net public benefit while meeting legal and environmental requirements and responding reasonable, equitably, and effectively to the issues, concerns, and opportunities that have structured this Forest planning process. This additional information describes the tradeoffs that would occur among the net quantified benefits described in Section 17 and the nonquantified benefits described in Section 18. Except for the quantified economic benefits, the adequacy of each alternative's attempt to address issues, concerns, and opportunities is subject to the subjective values individual reveiwers attribute to the different resource mixes and degrees of response.

a. National, Regional, and Local Demand Outlook

To provide a framework for assessing responses to issues, concerns, and opportunities and the long term resource demands; the needs of the Nation, Region, and the local communities are reviewed in this section, very briefly.

The Resources Planning Act projects total national demands to rise for all resources provided through management of the National Forests; including timber,forage, outdoor recreation opportunities, experiences associated with wildlife and fish including hunting and fishing, water supply and many amenity uses of forest and range lands. There is clearly, as evidenced by the public's comments on the Revised Draft EIS, an expectation of the public that while these resource demands should be met, resource values must be protected. Further, production of resources should not adversely affect opportunities for the public to use other resources.

The markets for commodity resources such as timber or minerals are usually regional or national markets though production is accomplished by local people. On the Beaverhead National Forest, some of the mineral resource and the range forage resource supplied through management have regional significance. The timber resource, a commodity with products sent to markets in the midwest and southeast, has significance more in terms of local production than in terms of the national market. In 1984, the Beaverhead timber program constituted .2 percent of the total Forest Service board foot harvest nationally, and 2 percent of the total Northern Region board foot harvest.

Generally the users of National Forest outdoor recreation opportunities, the users of Wilderness, and the users of the wildlife and fisheries resources dependent on National Forest habitat are local people or people from the region surrounding the National Forest. Users of the Beaverhead National Forest seem to come primarily from Beaverhead, Madison, Deerlodge, Silverbow, and Gallatin counties. Use on the Forest from outside those counties occurs in large part during the fall hunting season, when it is not unusual to have hunters from Florida and California as well as from the rest of Montana. While the recreation use of the Beaverhead National Forest is expected to increase over the next fifty years, the capacity of the Forest to provide space for that recreational activity is not expected to be exceeded.

b. Economic Values and Responses to Major Issues, Concerns, and Resource Use or Development Opportunities

Relationships between priced and nonpriced outputs illustrate the interactions of attempting to resolve various issues. Competitive public issues, management concerns, and resource opportunities exist and it is impossible to fully meet all wants and desires at the same time. By examining an array of priced and nonpriced outputs it becomes possible to see what is given up and what is achieved as a range of alternatives is explored. An understanding of the tradeoffs between alternatives is required to help the decisionmaker decide which alternative maximizes net public benefits. The mixes of priced and nonpriced outputs resulting from each alternative are a direct result of the varied attempts to resolve the public issues discussed in Chapter I. A comparison of alternative response to major issues is displayed in Table II-4.

Appendix A fully discusses each of the issues, concerns, and opportunities. The seven major issues with the greatest influence on the alternatives and indicators of responsiveness for each include:

1. How much of the forage produced on the Beaverhead should be used by domestic livestock? What constraints should be applied to the domestic use of forage?
    Indicators--

--number of permitted AUM's

2. What areas should be managed for a continous supply of timber products? When and where should timber harvest be scheduled?
Indicators--
--volume of timber harvested
--long-term sustained yield
--suitable acres managed to permit scheduled timber harvest

3. To what degree should the various recreation opportunities be made available for public use?
Indicators--
--road construction miles
--acres to remain unroaded

4. What actions are necessary to provide wildlife habitat to meet elk and fish targets?
Indicators--
--acres providing effective elk habitat cover
--potential populations of fish supported by Forest stream habitat

5. What additional road rights-of-way are needed to provide reasonable public access to the Natinal Forest?

Indicators--
--road construction miles, per year and over the planning horizon

6. What effects will management area designation have on opportunities to explore for and develop mineral resources?

Indicators--
--wilderness acres
--unroaded acres

7. What inventoried roadless areas should be recommended for wilderness?

Indicators--
--wilderness acres

In addition the Nation as a whole has an interest in ensuring that the Forest is managed in a financially prudent manner while the quality of the physical environment is protected and enhanced. Addtional indicators are:

--budget costs
--cash receipts
--economic efficiency as measured by Present Net Value.

c. Differences and Similiarities of Individual Alternatives

Table II-19 identified the tradeoffs between monetary goals and the public issues associated with each alternative. The following discussion further explores the relationships within each alternative and between alternatives for the financial (quantified) and nonpriced, generally qualitatively defined, components of net public benefits.

The financial discussion for each alternative presents information and relationships regarding PNV, discounted costs, discounted benefits, and dollars foregone in efforts to address nonpriced resource values. The nonpriced discussion focuses on the categories of benefits summarized in Section 18. In general, as the alternatives respond more intensively and successfully to the nonpriced benefits available on the Forest, the PNV and timber harvest programs decrease.

1) Maximum PNV Benchmark

The maximum PNV of the Forest while meeting minimum management requirements, precluding timber management from existing wilderness, and harvesting a nondeclining flow of timber is $298 million. Timber harvest levels are high throughout the 150-year planning horizon with a long-term sustained yield capacity of 17.3 MMCF (51.9 MMBF). Forage available for domestic livestock grazing averages 180,000 AUM's per year in decade one, 10,000 AUM's less than the current situation. Wilderness classification recommendations do not increase Forest acreage above the 173,500 acres currently classified in the Anaconda-Pintler and Metcalf Wildernesses.

2) Alternative A

Alternative A (Current Level of Management) represents the 1978 Beaverhead National Forest Land Management Plan. It provides moderate levels of market outputs and the potential for moderate levels of nonmarket outputs with the expenditure levels that have been experienced in a recent three-year period (1980-82). These experienced budget levels lower nonmarket resource management levels, with costs constrained primarily in general administration, recreation and range management. The expenditure constraint is unique to Alternative A. It imposes on the 1978 Plan's management objectives and reduces the nonpriced outputs to a low level. The PNV of Alternative A is $196 million. Discounted costs are $133 million while discounted benefits are $329 million.

Approximately 1,050,000 acres would be managed at the custodial level in Alternative A, current management constrained by experienced budgets. This is compared to only 210,000 acres of custodial management if current management were as specified in the 1978 Land Management Plan, unconstrained by budget. The acres which are forced into custodial management are those formerly assigned wildlife, recreation, and range prescriptions; the resource outputs are still produced but at lower levels with less investment. The cost decreases will not reduce recreation use. Nor are range or timber production levels reduced. Rather, timber and range production are concentrated on the most economical sites, with less cost efficient areas moving into the custodial level of management.

The reduction in PNV associated with implementing Alternative A rather than the maximum PNV benchmark is $102 million. Alternative A is less costly in terms of general administration and recreation and range management because the expenditure constraint reduces these costs below the standards in the management prescriptions. Timber management and road construction costs are lower because the timber program is smaller. Thirty-eight percent less volume is harvested and 29 percent fewer roads are needed for management due to a suitable timber land base that is 27 percent smaller. The discounted timber benefit is 42 percent less in Alternative A than in the maximum PNV benchmark.

Big game hunting quality is moderate to low when evaluated in terms of effective hiding cover. As a result of timber harvest and road construction, hiding cover is reduced over time and by decade 5 it is fifth lowest of the alternatives considered. Following decade 5, effective hiding cover stabilizes as the road system needed for management is completed. The intensity of management occurring on the suitable timber base in this alternative is moderate to high, with associated adverse impacts on big game hunting quality in these areas.

In Alternative A as in all other alternatives, best management practices will be utilized and State of Montana Water Quality standards will be met. The moderate levels of timber harvest can be distributed throughout the suitable land base to minimize potential for sediment introduction to streams. However, the roads needed for management are high relative to the timber harvest program, making it more difficult and more costly to meet State Water Quality Standards. The budget constraint affecting implementation of this alternative does not allow for watershed improvement projects.

Alternative A represents the unroaded management direction incorporated into the 1978 Land Management Plan. A little less than half the Forest will remain undeveloped in that no road construction is anticipated. However, mineral development or the need for access to adjacent areas with scheduled timber harvest could reduce this unroaded acreage. This unroaded land base is moderate relative to other alternatives.

In addition to the nonwilderness unroaded areas on the Forest, this alternative would result in wilderness acreage that is about 15 percent of the Forest, fourth lowest of the alternatives considered. The wilderness areas in this alternative would consist of the two areas already classified and, in addition, the areas recommended by the Forest Service in RARE II.

The diversity and quality of the recreational setting available under this alternative is generally broad given the range of alternatives considered. By and large, the existing situation is maintained, with about one million acres available for unroaded recreation opportunities, including primitive, semiprimitive motorized, and semiprimitive nonmotorized recreation opportunities. In areas of particular interest to the public--the West Big Hole, West Pioneers, East Pioneers, North Big Hole, Snowcrest, Storm Mountain area and Tobacco Roots--a variety of management directions will be pursued. About 164,200 acres including portions of the East Pioneers, West Big Hole, and the Storm Lake area would be recommended for wilderness. Substantial acreages of the areas will remain unroaded.

Mineral accessibility and availability under Alternative A will be moderate to high in the range of alternatives considered. The high acreage within the custodial management category will require relatively few restrictions on access.

Generally, Alternative A continues the status quo for economic stability, maintaining existing timber harvest levels and production of forage for domestic livestock; however this alternative does not improve stability in that production levels in other resource areas, that could be new employment areas, are not very high.

Existing relationships to the Forest would be maintained for the first decade but over time, as additional suitable timber land is accessed for timber harvest, motorized access would increase, affording local residents motorized access to National Forest lands. Low levels of investment in recreation would not allow for any improvement over the existing situation in developed campgrounds, trailhead facilities, or recreational access roads. In fact, the condition of these facitilities will deteriorate.

3) **Alternative B**

Alternative B provides high levels of market resources with limited consideration for nonmarket outputs and is responsive to the RPA Program objectives for both range and timber. This alternative does not recommend any additional wilderness classification. Alternative B has the highest long-term sustained yield capacity of timber, the highest discounted timber costs, the highest discounted timber benefits, and the second highest PNV of all the alternatives considered. The PNV of Alternative B is $244 million, with $158 million in discounted costs and $401 million in discounted benefits.

The reductions in PNV of implementing Alternative B instead of the maximum PNV benchmark is $54 million. Present value costs for Alternative B are almost the same as for the maximum PNV benchmark. Only road costs are slightly lower and "other" costs are slightly higher. Present value benefits for Alternative B are $401 million or 12 percent less than the maximum PNV benchmark. The difference in benefits is due to the RPA constraints imposed on the timber program. The benefit/cost ratio for Alternative B is 2.55, the second highest of the alternatives considered. Alternative B provides a very cost-efficient program for management.

The timber harvest level in decade one is the fourth highest of the alternatives, but by the third decade the timber harvest level is the highest of the alternatives. The range program is not the highest in decade one but increases over time more than other alternatives do.

The emphasis placed on market resources has implications for the ability of this alternative to fully provide the nonpriced benefits that contribute to the net subjective value of the Forest.

Big game hunting quality would be more adversely affected under this alternative than under any of the other alternatives considered because the high long-term sustained yield capacity of timber and the large suitable land base (largest of the alternatives considered) will reduce effective hiding cover for elk and require a high intensity of development activities over a large portion of the Forest over time. Elk hunting opportunities, measured in recreation visitor days, are reduced by the fifth decade to a level lower than associated with the other alternatives.

Alternative B, like all the other alternatives, requires that best management practices will be utilized and State of Montana Water Quality standards will be met. However, the high levels of timber harvest will be more difficult to distribute over the suitable land base to ensure that the potential for sediment introduction to streams will be minimized. In addition, sale preparation costs may increase over time as the harvest level pushes new sales up against old. Design and layout will be more difficult to accomplish. The roads needed for management are high as a result of the timber harvest program, making it difficult and costly to meet State Water Quality Standards with the road construction program.

Alternative B does not recommend any additional wilderness classification, but retains the two existing areas. Unroaded area management is designated for approximately half the Forest, about the same acreage as would occur under continuation of the 1978 Land Management Plan. No road construction is scheduled into these acres, however mineral development or the need for access to adjacent areas with scheduled timber harvest could reduce this roadless acreage. This unroaded land base is moderate relative to other alternatives. Wilderness acreage under this alternative would be limited to the Anaconda-Pintler and Lee Metcalf Wilderness areas and total about 8 percent of the Forest, lowest of the alternatives considered.

Achievement of a diverse and quality recreational setting under this alternative is not a management objective but a byproduct of the primary assignment of lands to meet the timber and range RPA objectives. In other words, lands not capable of timber production or where forage production would not require road construction are available for unroaded recreation opportunities. By and large, the existing acreage situation is maintained, with slightly more than one million acres available for unroaded recreation opportunities, including primitive, semiprimitive motorized, and semiprimitive nonmotorized recreation opportunities. In nonwilderness areas of particular interest to the public--the West Big Hole, West Pioneers, East Pioneers, North Big Hole, Snowcrest, and Tobacco Roots--nonwilderness management direction will continue, with some reduction in the inventoried roadless land base where timber management activities will be pursued. Still, portions of these areas will remain undeveloped and unroaded.

Mineral accessibility and availability under Alternative B will be high in the range of alternatives considered. The high acreage within the custodial management category will require relatively few restrictions on access. The large acreage in the suitable land base accessed by roads and with limited wildlife habitat protection restrictions will facilitate mineral exploration and development activities. With no additional wilderness recommendations, no additional areas would be withdrawn from mineral entry and mineral leasing.

Alternative B will provide timber harvest levels that would significantly increase the potential for employment in the timber industry in the area; however, this alternative does not necessarily improve economic stability in that production levels in other resource areas, that could be new employment areas, are not very high. The role of the timber industry in the area could significantly increase. The livestock industry would, in the short term, remain static but could build over time. Recreation related industries would not grow.

Existing relationships to the Forest would be changed over time and even in the first decade as the large suitable timber land base is accessed for timber harvest, and as the annual harvest level increases the role of timber in the local economy and lifestyles. Motorized access would increase, affording local residents motorized access to National Forest lands. Low levels of investment in recreation would not allow for any improvement over the existing situation in developed campgrounds, trailhead facilities, or recreational access roads. In fact, the condition of these facitilities will deteriorate. The types of lands assigned unroaded management prescriptions will be similar in acreage but reduced in diversity from the existing situation.

4) **Alternative C**

Alternative C provides high levels of market resources while at the same time recommending a significant percentage (75 percent) of the inventoried roadless lands for wilderness classification. This alternative has the lowest benefit/cost ratio, and the highest costs of all the alternatives considered. Alternative C is the most expensive alternative in terms of discounted costs because it has the second largest timber program and fourth largest road construction program of the alternatives occurring on one of the smallest suitable land bases with additionally the second largest wilderness acreage. The timber benefits received for the dollars invested are 37 percent lower than for the maximum PNV benchmark. Efficiency could be improved by lowering the timber harvest, or wilderness objectives. The PNV of Alternative C is $170 million. The discounted costs total $174 million (compared to $158 million for the Max PNV benchmark) and the discounted benefits total $344 million (Max PNV benchmark benefits are $456 million).

The reductions in PNV of implementing Alternative C rather than the maximum PNV benchmark is $128 million. The discounted costs are 9 percent higher while the discounted benefits are 25 percent lower. The changes in benefits and costs are due to requiring the timber and range programs to meet RPA objectives for five decades on a comparatively limited land base. The suitable land base for Alternative C is 537,200 acres, compared to 730,600 acres for the maximum PNV benchmark.

Alternative C is very similar to Alternative B in that it provides a high production level for commodity resources, most specifically timber and range. However, Alternative C is different from Alternative B in that it also strives to produce a large amount of a noncommodity resource--wilderness. In striving to produce high levels of timber and range while also recommending a substantial amount of inventoried roadless acreage for wilderness classification, some nonpriced benefits are lost or achieved at low levels.

Big game hunting quality would be adversely affected under this alternative to a degree second only to Alternative B. This is because the long-term sustained yield capacity of timber is the second highest of the alternatives considered and the suitable timber base is only the fifth largest of the alternatives considered. Thus, although a large wilderness designation will provide security for big game, with the exclusion of road construction, the effective hiding cover on the remainder of the Forest will be significantly reduced due to the extremely high intensity of development activities concentrated in a portion of the Forest over the planning horizon. Elk hunting opportunities, measured in recreation visitor days, are reduced by the fifth decade to a level lower than associated with the other alternatives with the exception of Alternative B, which is lower.

Alternative C requires that best management practices will be utilized and State of Montana Water Quality standards will be met. However, the high levels of timber harvest concentrated within a limited suitable timber base will be difficult to distribute adequately to ensure minimization of the potential for stream sedimentation. Sale preparation costs may increase over time as the harvest level pushes new sales up against old. Design and layout will be more difficult to accomplish. The roads needed for management are high as a result of the timber harvest program, though not as high as for alternative B with a larger suitable land base. The road construction program needed for this alternative will make it difficult and costly to meet State Water Quality Standards.

Alternative C recommends about 75 percent of the existing inventoried roadless acres for wilderness classification. Unroaded management for the remainder of the Forest is reduced from the million acres that would exist under the 1978 Land Management Plan (Alternative A) to less than 300,000 acres. No road construction is scheduled into the 300,000 acres; however, mineral development or the need for access to adjacent areas with scheduled timber harvest could further reduce this undeveloped acreage. Under Alternative C the unroaded portion of the Forest exclusive of wilderness areas would be the second lowest of the alternatives considered. The Forest would generally be assigned to wilderness or intensive development of commodity resources with little management aimed at anything in between those two extremes.

Achievement of a diverse and quality recreational setting under this alternative is very difficult because the two mutually exclusive management objectives--intensive timber management and wilderness management--absorb the bulk of the Forest land. Only those areas not recommended for wilderness classification, not capable of timber production, or where forage production would not require road construction, are available for unroaded primitive or semiprimative recreation opportunities. Most of the areas currently inventoried as roadless but not classified as wilderness of particular interest to the public--the West Big Hole, West Pioneers, East Pioneers, North Big Hole, Snowcrest, and Tobacco Roots--are recommended for wilderness classification, significantly eroding the motorized recreation opportunities in these areas. Snowmobilers and trailbike riders would have to seek recreation opportunities in developed areas as unroaded acres that are not classified wilderness will be limited.

Mineral accessibility and availability under Alternaive C will be low in the range of alternatives considered; however, will be very high in the portions of the Forest not recommended for wilderness classification. The acreage in the suitable land base will be fully accessed by roads with limited wildlife habitat protection restrictions, facilitating mineral exploration and development activities. Over one million acres recommended for wilderness classification will be withdrawn from mineral entry and mineral leasing, adversely impacting accessibility in many areas with high favorability.

Alternative C will provide timber harvest levels that would significantly increase the potential for employment in the timber industry in the area over the long term; however, the first decade harvest level is only slightly higher than the harvest level experienced over the last few years. The role of the timber industry in the area could significantly increase over time. The livestock industry would in the short term remain static but could build over time also. Recreation related industries that cater to backcountry recreation activities such as outfitters, sporting goods shops, and so on would have the opportunity to grow, although increasing the acreage designated wilderness does not ensure immediate increases in use, especially since the projected levels of use on the Beaverhead National Forest can be met by the capacity of existing classified areas. This alternative could improve economic stability over time by allowing for growth in several economic sectors.

Existing relationships to the Forest would be changed over time and even in the first decade as the large unroaded acreage of the Forest is classified wilderness and motorized use is prohibited in areas where it has traditionally occurred. The role of timber and of backcountry recreation in the local economy and in people's lifestyles could substantially change. Motorized access to a portion of the Forest would increase affording local residents motorized access to National Forest lands which have been developed. On the other hand, motorized access in inventoried roadless areas would be substantially decreased. Management of the Forest would result in intensively developed areas and wilderness, with little in between.

5) **Alternative D**

Alternative D emphasizes recreation opportunities and the protection and maintenance of elk habitat. This alternative focuses on the amenity resources, such as recreation and wildlife, by restricting timber harvest to areas that have already been developed and by recommending about 62 percent of the roadless areas on the Beaverhead National Forest for wilderness classification. This alternative has the lowest PNV of all the alternatives primarily because of the low timber harvest program. Timber benefits are lower than in other alternatives but other resource benefits remain as high as in the other alternatives considered. The benefit/cost ratio of this alternative is low but not as low as for Alternative C. The PNV of Alternative D is $136 million with discounted costs of $117 million and discounted benefits of $253 million.

The reductions in PNV of implementing Alternative D rather than the maximum PNV benchmark is $162 million. Alternative D is $41 million less expensive in terms of discounted costs; but $203 million less productive in terms of benefits. The timber and road programs are the primary cause of the differences. The long-term sustained yield capacity of Alternative D is 6.0 MMCF while the long-term sustained yield capacity of the maximum PNV benchmark is 17.3 MMCF. The suitable timber land base of Alternative D is 313,100 acres or 57 percent smaller than the maximum PNV benchmark suitable land base. Future timber harvest is constrained by the size and degree of development of the suitable land base. Most of the reduction in PNV is due to foregone timber values.

Big game hunting quality would be least adversely affected under this alternative but the timber harvest program and road costruction needed to support the program still result in a decline in big game hunting quality if measured in terms of effective hiding cover. A relatively large assignment of roadless lands to wilderness designation (about 62 percent) will provide security for big game. The effective hiding cover on the remainder of the forest will be reduced through timber harvest and road construction; however, constraints restricting the distribution of the timber harvest in time and space minimize the impacts on effective cover. Elk hunting opportunities, measured in recreation visitor days, are least reduced of the alternatives considered except the Proposed Action.

Like the other alternatives, Alternative D requires use of best management practices and compliance with State of Montana Water Quality standards. The low levels of timber harvest well distributed over the suitable timber base as a result of the wildlife constraints ensures that this alternative should not have any difficulties in minimizing the potential for stream sedimentation. Sale preparation costs should not increase over time as the harvest level and suitable land base should allow for adequate flexibility in scheduling and timber sale design and layout. The roads needed for management are the lowest of the alternatives considered. The development activities are only scheduled in areas already developed and accessed by roads, minimizing the need for additional construction and increasing abilities of the Forest to comply with State Water Quality Standards.

Alternative D recommends about 62 percent of the existing inventoried roadless acres for wilderness classification. Unroaded management for the remainder of the Forest is reduced from the million acres that would exist under the 1978 Land Management Plan (Alternative A) to about 670,000 acres. No road construction is scheduled into the 670,000 acres; however, mineral development or the need for access to adjacent areas with scheduled timber harvest could further reduce this unroaded acreage. Under Alternative D the unroaded, undeveloped acres exclusive of wilderness areas would be moderate in the range of alternatives considered. The Forest would have additional wilderness acreage, a suitable timber base or developed land base smaller than would result from continued implementation of Alternative A and a moderately large unroaded land base.

Achievement of a diverse and quality recreational setting under this alternative would be achievable because the suitable timber base is smaller than in the other alternatives, and although almost half the Forest would be classified as wilderness, 670,000 acres would produce recreation opportunities in an unroaded setting outside classified wilderness. Still, in Alternative D, most of the areas currently inventoried as roadless but not classified as wilderness of particular interest to the public--the West Big Hole, East Pioneers, North Big Hole, Snowcrest, and Tobacco Roots--are recommended for wilderness classification, significantly eroding the motorized opportunities in these areas. A core area in the West Pioneers would be managed to provide nonwilderness but unroaded recreation.

Mineral accessibility and availability under Alternative D will be low to moderate within the range of alternatives considered. This alternative will not increase any access over that existing; therefore, accessibility through roads constructed for timber management is more limited than under other alternatives. Still, mineral exploration and development activities could lead to the roading of unroaded areas so long as constraints imposed for wildlife habitat protection and recreation management concerns were met. The almost one million acres recommended for wilderness classification will be withdrawn from mineral entry and mineral leasing, adversely impacting accessibility in many areas with high favorability.

Alternative D will decrease timber harvest levels and could impact the local employment in the timber industry. The role of the timber industry in the area could significantly decrease over time, with associated adverse impacts on economic stability for the area. The livestock industry would generally remain static, with slightly fewer potential AUM's available on National Forest lands.

Recreation related industries that cater to backcountry recreation activities such as outfitters, sporting goods shops, and so on would have the opportunity to grow although increasing the acreage designated wilderness does not ensure immediate increases in use, especially since the projected levels of use on the Beaverhead National Forest can be met by the capacity of existing classified areas. In summary, this alternative would have some adverse impact on economic stability because of the timber program.

Existing relationships to the Forest would be least changed over time under this alternative in that only the existing developed lands are managed for timber, retaining the roadless land base intact for the future. However, as 62 percent of the large unroaded acreage of the Forest is classified wilderness and motorized use is prohibited in areas where it has traditionally occurred, existing land use patterns will be forced to change and the lands available for motorized recreation such as snowmobiling and trail biking will be reduced. The role of timber and of backcountry recreation in the local economy and in people's lifestyles could substantially change.

6) **Alternative F**

Alternative F attempts to produce a moderate to high level of commodity resources while at the same time mitigating the impacts of development of the timber resource in particular by incorporating scheduling constraints and harvest distribution constraints. Approximately 37 percent of the inventoried roadless acres are recommended for wilderness classification. Wildlife management prescriptions are assigned to important wildlife areas. This alternative has the fourth highest PNV of all the alternatives; and also the fourth highest discounted costs and benefits. The benefit/cost ratio however is only the sixth best of the alternatives. Relatively high costs are involved in attaining the dollar benefits associated with this alternative but the higher production level for timber ensures a relatively high PNV. The PNV of this alternative is $200 million; discounted costs total $148 million and discounted benefits total $348 million.

The reduction in PNV of Alternative F is $98 million. The benefit/cost ratio of Alternative F--2.35 can be compared to the benefit/cost ratio of the maximum PNV benchmark--2.89. The benefit/cost ratio of Alternative F could be improved with the removal of the constraints designed to protect wildlife habitat, or with an increase in the size of the suitable timber land base. Alternative F has a suitable timber base of 609,300 acres, third largest of the alternatives but still 121,300 acres or 17 percent less than the suitable timber base of the maximum PNV benchmark. With a larger land base, the benefit/cost ratio and hence PNV could be improved as more flexibility in scheduling the timber program would exist. Managing for a moderate to high level of timber production while maintaining elk security areas and a distribution of harvest that permits maintenance of hiding cover is expensive in terms of direct costs and foregone investment opportunities.

Alternative F tries to produce commodity resources while also achieving nonpriced benefits. Active wildlife habitat improvement activities including timber harvest designed to enhance or maintain habitat components are emphasized. This alternative also provides for timber harvest and livestock forage utilization where suitable. Where inventoried roadless areas' resource values, especially wildlife values, can be best managed through wilderness classification, wilderness is recommended. This alternative has a relatively high level of timber harvest and a large suitable timber land base.

Big game hunting quality would be adversely affected by the timber harvest activities and associated road construction program of this alternative but the wildlife habitat protection constraints incorporated into the alternative, ensuring a broad distribution of harvest in space and time, ensure that adverse impacts are reduced from what they could be. Still, the level of harvest means the indices of hunting quality--primarily effective security cover--for this alternative are worse than for alternatives with lower timber harvest programs, such as Alternative D. The intensity of management activities is less than occurs in several other alternatives, again because special efforts are made to distribute the harvest over space and in time. Elk hunting opportunities, measured in recreation visitor days, are reduced by decade five to the same level that would occur with implementation of Alternative A; however, by incorporating wildlife concerns in the timber program, Alternative F is able to sustain a long-term yield 4 MMBF higher than Alternative A with no greater impacts on hunting opportunities.

Alternative F is similiar to the other alternatives in that it requires use of best management practices and compliance with State of Montana Water Quality standards. Although the timber harvest program is well distributed over the suitable timber base as a result of the wildlife constraints, the level of harvest means more difficulty in minimizing the potential for stream sedimentation. Sale preparation costs may increase over time as the harvest level requires that additional sales be fit into a drainage while protecting both the watershed and wildlife values. The roads needed for management are among the highest of the alternatives considered. This is because of the distribution requirement impacting the timber program. The construction needs make meeting State Water Quality Standards difficult.

About 37 percent of the existing inventoried roadless acres are recommended for wilderness classification under Alternative F. Unroaded area management for the remainder of the Forest is reduced from the million acres that would exist under the 1978 Land Management Plan (Alternative A) to about 656,000 acres, almost the same acreage as associated with Alternative D. Although no road construction is scheduled into the 656,000 acres, mineral development or the need for access to adjacent areas with scheduled timber harvest could further reduce this unroaded and undeveloped acreage. Under Alternative F the unroaded area exclusive of wilderness areas would be moderate in the range of alternatives considered. The Forest would have some additional wilderness acreage (roughly one-third of the Forest), a suitable timber base or developed land base larger than that designated suitable by the 1978 Land Management Plan represented by Alternative A (one-third of the Forest) and a moderately large unroaded land base (the remaining one-third of the Forest).

Achievement of a diverse and quality recreational setting under this alternative should be achievable because the Forest eventually would be one-third developed, one-third unroaded, and one-third wilderness. This alternative proposes a variety of management options for the areas currently inventoried as roadless but not classified as wilderness and of particular interest to the public. Some of the West Big Hole, East Pioneers, North Big Hole, Snowcrest, and Tobacco Roots--are recommended for wilderness classification, eroding the motorized opportunities in these areas to some extent but not to the extent of

Alternatives C and D. The remainder of these areas and a core area of the West Pioneers would be managed to provide nonwilderness but unroaded recreation.

Mineral accessibility under Alternative F will be moderate within the range of altenatives, with restrictions primarily related to wildlife habitat protection constraints or to the withdrawals that would be associated with the recommendations for wilderness classification. Mineral exploration and development activities could lead to the roading of unroaded areas; so long as constraints imposed for wildlife habitat protection and recreation management concerns were meet.

Alternative F will increase timber harvest levels (in the first decade to the third highest level of the alternatives considered) and could impact the local employment in the timber industry providing opportunities greater than currently provided. The role of the timber industry in the area could significantly increase in the short term but the long-term increases would be somewhat less significant because the long-term sustained yield capacity of Alternative F is only 4 MMBF greater than Alternative A (Current Level of Management). The livestock industry would generally remain the same as it currently is, with slightly more potential AUM's available on National Forest lands. This alternative would have some positive impacts on economic stability because of the timber program and because an effort is made to maintain other resource values that contribute directly and indirectly to the economic base such as wildlife habitat.

Existing relationships to the Forest would be changed over time under this alternative. Road construction is extensive and the suitable timber land base is large, indicating that significant increases in public access would occur over time. The public's use of the wildlife resource on the Forest would be perpetuated, but the environment for hunting and fishing would be changed. The role of timber in the local economy and in people's lifestyles could change.

7) **Alternative G**

Alternative G provides an opportunity to manage the Beaverhead National Forest with the lowest reduction in PNV of any alternative, with only small additional recommendations for wilderness classification. Cost efficiency is used as the primary guide in the determination of proposed land uses and production schedules. This alternative has the highest PNV of the alternatives considered, with the second highest level of discounted benefits and the fifth highest level of investment needed for management as defined by discounted costs. The PNV is $249 million; discounted costs are $146 million and discounted benefits are $396 million. The benefit/cost ratio of Alternative G is 2.70--highest of the alternatives considered.

The costs associated with Alternative G are lower than several of the other alternatives for a variety of reasons. First, few constraints are imposed on resource management that increase the costs above a basic level. Second, production of resources is not pushed above that defined to be cost efficient, limiting the level of cost incurred.

The reduction in PNV of implementing Alternative G rather than the maximum PNV benchmark is $49 million. The discounted costs are $12 million less and discounted benefits are $60 million less. Alternative G has the least reduction in PNV of all the alternatives, achieving a PNV that is 84 percent of the maximum PNV attainable on the Forest. The long-term sustained yield capacity of Alternative G is 13.3 MMCF, 41.2 MMBF or 77 percent of the long-term sustained yield capacity that would occur if maximum cost efficiency was achieved. The suitable timber base of Alternative G is 547,600 acres, 75 percent of the suitable timber base of the maximum PNV benchmark. The net discounted timber value is $54 million less or 20 percent less than the value in the maximum PNV benchmark. The domestic livestock forage program in decade 1 is 185,000 AUM's per year, slightly higher than for the maximum PNV benchmark. Range costs and benefits are approximately the same per AUM as for the other alternatives and for the maximum PNV benchmark.

Nonpriced benefits are not highlighted by the management objectives of this alternative unless it is cost efficient to provide them or they are outputs associated with the production of a priced resource.

The relatively high timber harvest schedule of this alternative adversely impacts big game hunting quality in that the objectives of the timber program are optimization of benefit/cost relationships not achievement of compatibility between the timber program and wildlife habitat protection. The first decade harvest level is the highest of the alternatives, and the long-term sustained yield capacity is third highest. The level of harvest means the indices of hunting quality--primarily effective security cover--for this alternative are worse than for alternatives with lower timber harvest programs, such as Alternative D but not as bad in the early decades as those alternatives with more extensive road construction programs, such as Alternative B. The intensity of management activities is greater than occurs in several other alternatives, primarily because of the cost-efficient objectives of the alternative unconstrained by wildlife or visual concerns. Elk hunting opportunities, measured in recreation visitor days, are reduced by decade five to one of the lowest levels of the alternatives considered.

Like the other alternatives, Alternative G requires use of best management practices and compliance with State of Montana Water Quality standards. Because the timber harvest program is not as well distributed over the suitable timber base as for example Alternative F which incorporates the wildlife constraints, the level of harvest and scheduling of harvest activities increases difficulty associated with the minimization of potential for stream sedimentation. Sale preparation costs may increase over time as the harvest level requires that additional sales be fit into a drainage while protecting both the watershed and wildlife values. The pure cost efficiency criteria used in scheduling the timber harvest program means that the roads needed for management are relatively few considering the level of harvest programmed. The construction needs make meeting State Water Quality Standards difficult but less difficult than for alternatives with higher road construction needs.

In Alternative G, very few acres of additional wilderness is recommended with the assumption that wilderness classification may not be cost efficient. Inventoried roadless lands could remain unroaded and undeveloped but managed with the custodial management prescription, for example. About 5 percent of the existing inventoried roadless acres are recommended for wilderness classification under Alternative G. Unroaded management for the remainder of the Forest is second only to Alternative H in acres scheduled to remain unroaded and a slight increase from the million acres that would exist under the 1978

Land Management Plan (Alternative A). Although no road construction is scheduled into the 1,051,000 acres, mineral development or the need for access to adjacent areas with scheduled timber harvest could further reduce this unroaded acreage.

Achievement of a diverse and quality recreational setting under this alternative would be difficult given the management objectives focus on cost efficiency and priced benefits of resource values. Diversity and quality would not be the priorities used in decision making. However, because the Forest would have over one million acres unroaded, and much of that could be open for motorized use, some defacto diversity and quality would result. The diversity of wilderness recreation opportunities would generally not change from the existing situation. This alternative proposes primarily unroaded management for the areas currently in the inventoried roadless category but not classified as wilderness and of particular interest to the public--the West Big Hole, East Pioneers, North Big Hole, Snowcrest, West Pioneers, and Tobacco Roots.

Mineral accessibility under Alternative G will be moderate to high in the range of alternatives considered, with very few restrictions imposed. The cost efficiency management objectives of this alternative and the very low additional wilderness recommendations result in an alternative generally favorable to mineral exploration and development activities, although two areas with high favorability for mineral and energy resources are recommended for withdrawl from mineral entry and mineral leasing.

Alternative G will significantly increase timber harvest levels (in the first decade in particular) and could impact the local employment in the timber industry providing opportunities greater than currently provided. The role of the timber industry in the area could significantly increase in the short term and in the long term. The increase in timber harvest levels without associated increases in resource production for other resources could unbalance the local economy. The livestock industry would generally remain the same as it currently is, with slightly less potential AUM's available on National Forest lands.

Over time this alternative would significantly change existing relationships to the Forest. Road construction is extensive and the suitable timber land base is large, indicating that significant increases in public access would occur over time. The public's use of the wildlife resource on the Forest would be adversely affected, with the environment for hunting and fishing changed through the emphasis on commodity resources. Historically, management has not been guided solely by cost-efficient criteria, so many resouce benefits and services the public has become accustomed to would not be available or would be more limited. The role of timber in the local economy and in people's lifestyles would change.

8) Alternative H

Alternative H responds to the variety of resource use demands and concerns of the publics who utilize the Beaverhead National Forest lands and resources. This alternative provides a high level of roadless recreation opportunities as well as recommendations for wilderness classification in some of the inventoried roadless areas receiving highest public support for classification. Wildlife concerns are also addressed through constraints on the spacial and temporal distribution of the timber program. In addition, timber harvest for the first four decades is concentrated in areas of lodgepole pine, highly susceptible to infestations of mountain pine beetle. Because of the constraints imposed to achieve nonpriced objectives, this alternative has the fourth lowest PNV. The costs are fifth lowest of the alternatives considered. The discounted benefits associated with this alternative are fourth lowest, indicating a higher cost for benefits produced than for several of the other alternatives. The PNV of Alternative H is $157 million. The discounted costs total $132 million and the discounted benefits are $289 million.

The management analysis for Alternative H was conducted twice with two different assumptions--that the nonwilderness recommendation of the Montana Wilderness Study DEIS for the West Pioneers was accepted by Congress, and that the nonwilderness recommendation would not be accepted by Congress. The analysis with the West Pioneers managed for nonwilderness uses included is referred to as Alternative Ha, discussed in detail below. The analysis with the West Pioneers in custodial management, awaiting a decision on the wilderness/nonwilderness status, is called Alternative H. If the nonwilderness recommendation is accepted by Congress, the designations displayed in alternative Ha (displayed formerly in the 1982 Land and Resource Management Plan DEIS) would be implemented. Until the decision is made, Alternative H would be implemented, and if the decision was in favor of wilderness, Alternative H more accurately models management and resource output implications.

The reduction in PNV of implementing Alternative H rather than the maximum PNV benchmark is $141 million. Precluding timber management from 53 percent of tentatively suitable timberland, dispersing timber harvest over the Forest, achieving other wildlife habitat maintenance objectives, and emphasizing lodgepole pine harvest in the early decades result in the net timber value of only 43 percent of the value in the maximum PNV benchmark. The timber costs are 39 percent less than in the maximum PNV benchmark; road costs are 45 percent less than in the maximum PNV benchmark; however, the timber benefits are 55 percent less. The suitable timber base of Alternative H is 52 percent of the base associated with the maximum PNV benchmark. The long-term sustained yield capacity of Alternative H is 10.4 MMCF, compared to 17.3 MMCF for the maximum PNV benchmark. In summary, Alternative H has a relatively low PNV because this alternative attempts to respond to the variety of resource management demands of the public for timber, wilderness and roadless recreation areas, elk security, diversity, water quality, and fish populations--not all of which contribute priced benefits to any calculations of PNV. The tradeoffs of providing nonmarket resources are reflected in the benefit/cost ratio as well as in PNV.

The nonmarket resource and timber harvest objectives limit the net discounted timber value and the recreation management objectives increase the costs of recreation management activities but do not generate priced outputs.

Impacts on big game hunting quality in this alternative are relatively low because the objectives of the timber program are to harvest timber while maintaining adequate security for big game populations. The harvest level is fifth lowest of the alternatives considered, providing flexibility to maintain some compatibility between the timber harvest program and wildlife habitat protection. Wildlife constraints are woven into the scheduling of harvest over space and through time within the wildlife emphasis prescriptions to ensure protection of habitat. The level of harvest and wildlife constraints mean the indices of hunting quality --primarily effective security cover--for this alternative are better than for all other alternatives except alternatives D, S, Sa and I. The intensity of management activities is less than occurs in several other alternatives, primarily because of the wildlife concerns. Elk hunting opportunities, measured in recreation visitor days, are reduced by decade five but remain fifth highest of the alternatives considered.

Similar to the management objectives for the other alternatives, Alternative H requires use of best management practices and compliance with State of Montana Water Quality standards. The wildlife constraints requiring distribution of harvest throughout the suitable timber base provide benefits in water quality also, making it easier to meet State standards. Sale preparation costs may increase over time as the harvest level requires that additional sales be fit into a drainage while protecting both the watershed and wildlife values but not to the degree that they would if the level of timber harvest was higher. The roads needed for management are relatively few because of the harvest level. The construction needs make meeting State Water Quality Standards difficult but less difficult than for alternatives with higher road construction needs.

In Alternative H, the inventoried roadless lands recommended for wilderness classification are the areas with the highest levels of public support for classification and where conflicts with other resource uses can be minimized. In total, about 15 percent of the Forest would be classified wilderness under this alternative. The acreage that would be assigned management prescriptions that do not call for road construction (thereby staying unroaded and essentially undeveloped) is the second highest of the alternatives considered, higher by 100,000 acres than Alternative A (Current Level Management). Although no road construction is scheduled into the 1,116,000 acres, mineral development or the need for access to adjacent areas with scheduled timber harvest could reduce this unroaded acreage.

Alternative H strives to achieve a diverse and quality recreational setting by maintaining the existing diversity and quality to the greatest extent possible while at the same time responding to emerging new uses and resource concerns. The 1.1 million acres of unroaded lands provide a diverse array of settings for motorized and nonmotorized recreation activities. The wildernesses currently classified and recommended also ensure diverse wilderness recreation opportunities. This alternative proposes a variety of management options for the areas currently inventoried as roadless but not classified as wilderness and of particular interest to the public--Storm Lake, the West Big Hole, East Pioneers, North Big Hole, Snowcrest, West Pioneers, and Tobacco Roots. Storm Lake, Italian Peak, and portions of the East Pioneers and West Big Hole would be recommended for wilderness; the remaining areas would be managed for roadless recreation and a recreation management area would be recommended for a portion of the West Big Hole. As noted above, the West Pioneers would be held in custodial status.

Mineral accessibility under Alternative H would be moderate within the range of alternatives considered, with restrictions imposed in the nonwilderness portions of the Forest responsive to the recreation, visual, and wildlife resource management concerns. Areas recommended for wilderness classification would be withdrawn from mineral entry and mineral leasing.

Alternative H will reduce timber harvest levels from the levels programmed in Alternative A (representing the 1978 Land Management Plan) but will generally be consistent with the timber harvest program for the Forest over the past five years. The impact on local employment in the timber industry would be to provide about the same number of opportunities currently provided. The livestock industry would generally remain the same as it currently is, with slightly more potential AUM's available on National Forest lands.

Over time this alternative would change existing relationships to the Forest but the changes generally would be less than under most other alternatives. Road construction associated with the timber program will eventually increase public access to the National Forest, but the small suitable timber land base will limit the scope of that change. The public's use of the wildlife resource on the Forest should be perpetuated in spite of the timber harvest program, although as in all alternatives the environment for hunting and fishing will change somewhat. The large unroaded land base is the main unchanging feature of this alternative, maintaining the recreation environment the public has become accustomed to.

9) **Alternative Ha**

Alternative HA is exactly the same management alternative as Alternative H; however, the West Pioneer Wilderness Study Area is assigned a variety of nonwilderness management prescriptions, including a central core area of roadless recreation management (about 62,000 acres) and 55,200 acres that are designated suitable for timber production. As indicated for Alternative H, Alternative HA responds to the variety of resource use demands and concerns of the publics who utilize the Beaverhead National Forest lands and resources. As in Alternative H, timber harvest for the first four decades is concentrated in areas of lodgepole pine, highly susceptible to infestations of mountain pine beetle. Because of the constraints imposed to achieve nonpriced objectives, this alternative has a low PNV but due to the addition of a portion of the West Pioneers to the suitable timber land base, the PNV increases from forth lowest for Alternative H to fifth lowest. The PNV of this alternative is $168 million and discounted costs and benefits are $139 million and $307 million respectively.

The reduction in PNV of implementing Alternative HA rather than the maximum PNV benchmark is $130 million. Precluding timber management from 46 percent of tentatively suitable timberland (from 41 percent of the economically suitable as described in the maximum PNV benchmark), dispersing timber harvest over the Forest, achieving other wildlife habitat maintenance objectives, and emphasizing lodgepole pine harvest in the early decades result in the net timber value of only 52 percent of the value in the maximum PNV benchmark. Still, the timber value of Alternative HA is 11 percent higher than for Alternative H. The timber costs are $10 million less than in the maximum PNV benchmark; road costs are $11 million less than in the maximum PNV benchmark; however, the timber benefits are $150 million less. Nondiscounted livestock grazing returns increase slightly in decade 1 to $275 thousand but decrease over time due to a decrease in timber harvest on transitory range.

Impacts on big game hunting quality in this alternative are relatively low because the objectives of the timber program are to harvest timber while maintaining adequate security for big game populations. Impacts are essentially the same as for Alternative H but moving the West Pioneers out of custodial management with some timber harvest and road construction results in an elk effective cover situation very similiar to Alternative A.

The impacts on water quality for alternative Ha are the same as for Alternative H in that both require use of best management practices and compliance with State of Montana Water Quality standards and have wildlife constraints requiring distribution of harvest throughout the suitable timber base.

Inventoried roadless area management for Alternative Ha is the same as for Alternative H. The only difference in terms of unroaded management is the West Pioneers. In this alternative, a core unroaded recreation area is identified.

The diversity and quality of the recreation setting is the same in Alternative Ha as it is in Alternative H with the exception of the West Pioneers. The West Pionners in Alternative Ha will be managed under a variety of management prescriptions, including timber, and wildlife emphases as well as a core unroaded recreation area.

Mineral accessibility under Alternative Ha would be the same as for Alternative H.

Alternative Ha will provide about 3 MMBF more timber in decade 1 than Alternative H and has a long term sustained yield capacity of 3.8 more MMBF. Alternative Ha has a timber program at about the same level as the levels programmed in Alternative A (representing the 1978 Land Management Plan) for the first decade but has a higher long-term sustained yield capacity. Thus, short-term impacts on the timber industry could generate some slight increase in employment opportunity but over the long term, potential looks even better. The livestock industry would generally remain the same as it currently is, with slightly more potential AUM's available on National Forest lands.

The impacts of this alternative on the public's relationships to the National Forest land and resources would be very similar to Alternative H.

10) **Alternative H (dept)**

Alternative H (dept) retains the same proposed land uses and has the same management objectives as Alternative H. However, Alternative H (dept) increases the first decades' timber harvest levels by departing from nondecling flow in an effort to accelerate the harvest of lodgepole pine susceptible to mountain pine beetle infestation. In providing flexibility for the departure, the wildlife constraints on scheduling of timber harvest were removed. This alternative has the seventh highest PNV of the alternatives considered, 10 percent higher than Alternative H. The increased flexibility in timber scheduling allows for improvement in PNV over the nondeparture Alternative H. However, the increase in PNV is not as great as it could be if harvest increased in stands other than lodgepole pine. The PNV of Alternative H (Dept) is $172 million. The discounted costs total $141 million and the discounted benefits are $313 million.

The reduction in PNV of implementing Alternative H (dept) rather than the maximum PNV benchmark is $126 million. Precluding timber management from about 53 percent of the tentatively suitable timberland (from 48 percent of the economically suitable as described in the maximum PNV benchmark), and emphasizing lodgepole pine harvest in the early decades contribute significantly to the reductions in PNV. Relaxation of the wildlife constraints forcing a distribution of timber harvest in time and space that were incorporated in Alternative H does not appreciably change PNV for the departure over what it is for Alternative H.

The discounted timber costs of Alternative H (dept) are $6 million (21 percent) higher than for Alternative H, but 22 percent lower than the discounted timber costs of the maximum PNV benchmark. The discounted timber benefits of Alternative H (dept) are $163 million, $23 million (14 percent) higher than for Alternative H, but only 53 percent of the discounted timber benefits of the maximum PNV benchmark.

Impacts on big game hunting quality in this departure alternative are higher than they are for Alternative H because the objectives of the timber program and the departure schedule do not allow for the wildlife constraints designed to maintain adequate security for big game populations. Maintenance of the flexibility for a departure schedule does not complement the flexibility needed to maintain compatibility between the timber harvest program and wildlife habitat protection.

Similar to the management objectives for Alternative H and the other alternatives, Alternative H (departure) requires use of best management practices and compliance with State of Montana Water Quality standards. The departure schedule in the first two decades in particular makes it difficult to meet State standards. Sale preparation costs may increase in those decades as the harvest level requires that additional sales be fit into a drainage while protecting both the watershed and wildlife values. The compressed construction needed to meet the departure schedule makes meeting State Water Quality Standards difficult but less difficult than for alternatives with higher road construction needs.

In Alternative H (departure), the inventoried roadless lands recommended for wilderness classification and the areas retained in an unroaded management category are the same areas as in Alternative H.

Alternative H (departure) generally provides the same diversity and quality of recreational setting as Alternative H.

Mineral accessibility under Alternative H (departure) would be the same as for Alternative H.

Alternative H (departure) will provide timber harvest levels in the first three decades that are very similar to the harvest levels programmed in Alternative A (representing the 1978 Land Management Plan) and slightly higher in decades one and two. The focus however is lodgepole pine, and the ability of local mills to handle additional small diameter lodgepole pine timber is limited. The long-term sustained yield capacity of Alternative H (departure) is 2.9 MMCF higher than Alternative H. Thus, in the short term, the impact of departure on local employment in the timber industry could be to provide more opportunities than currently provided (the current program is about 29 MMBF per year) as long as lumber mills can absorb the additional material. However, over the long term employment opportunities would fluctuate significantly. The livestock industry would generally remain the same as it currently is, with slightly more potential AUM's available on National Forest lands.

Over time this alternative would change existing relationships to the Forest but the changes generally would be less than under most other alternatives. Road construction associated with the timber program will eventually increase public access to the National Forest, but the small suitable timber land base will limit the scope of that change. The public's use of the wildlife resource on the Forest should be perpetuated in spite of the timber harvest program, although as in all alternatives the environment for hunting and fishing will change somewhat. The unroaded land base is an unchanging feature of this alternative, maintaining the recreation environment the public has become accustomed to.

11) **Alternative I**

Alternative I is the maximum wilderness benchmark brought forward in the analysis as an alternative. All lands included in the roadless area inventory are recommended for wilderness classification and modeled as wilderness. Thus 1,405,600 acres would be classified wilderness under this alternative including the two areas already classified (173,500 acres). About 66 percent of the Forest would be wilderness. All other lands are managed with cost efficiency as the primary guide used in the determination of proposed resource use and production schedules. In the nonwilderness portions of the Forest, management would be similiar to Alternative G. Alternative I has the smallest nonwilderness roadless land base of any of the alternatives; the third highest benefit/cost ratio; and a PNV that is moderate in the range of alternatives considered. The PNV of Alternative I is $180 million. The discounted costs are $120 million. Discounted benefits total $300 million.

The reduction in PNV associated with Alternative I is $118 million; that is, the difference between maximization of PNV and the objectives of Alternative I is $118 million. This is moderate in the array of alternatives considered. The discounted costs of Alternative I are $38 million less than those of the maximum PNV benchmark (24 percent less) while the discounted benefits of Alternative I are $156 million less (34 percent). The reductions in PNV is the result of a timber harvest reduced from the level scheduled in the maximum PNV benchmark, a substantially smaller suitable land base, and a large designation of land for wilderness management that has associated costs but no priced benefits that contribute to PNV because the capacity of the Forest exceeds projected levels of wilderness recreation demand.

Impacts on big game hunting quality in this alternative are relatively low because the substantial acreage recommended for wilderness classification ensures that security for big game populations is maintained. However, in the nonwilderness portion of the Forest this security is not necessarily protected. Thus, this Forest-wide situation is more positive than the more area specific situation will be. Forest-wide this alternative maintains security for big game to a degree second only to Alternative D and S. More site specifically, security would be good within the 66 percent of the Forest classified as wilderness and poor to fair on the remainder of the Forest (where it would resemble the situation under Alternative G. Elk hunting opportunities, measured in recreation visitor days, are reduced by decade five but remain second highest of the alternatives considered.

Alternative I has management objectives that are similiar to the management objectives for the other alternatives, requiring use of best management practices and compliance with the State of Montana Water Quality standards. The large acreage that will remain roadless and without timber harvest activities due to wilderness classification ensures that on at least that portion of the National Forest, it will be easy to meet State standards. In the remainder of the Forest, where the timber harvest program will be concentrated, sale preparation costs may increase over time as the harvest level requires that additional sales be fit into a drainage while protecting both the watershed and wildlife values but not to the degree that they would if the level of timber harvest was higher. The roads needed for management are relatively few because of the harvest level. The construction needs make meeting State Water Quality standards difficult but less difficult than for alternatives with higher road construction needs.

In Alternative I, all 1.2 million acres of roadless land included in the 1983 inventory are recommended for wilderness classification. This is about 66 percent of the Forest. Thus, a wide array of habitat types and land types are recommended for inclusion in the wilderness system. The remainder of the Forest would be managed for mineral, range forage, and timber production and still some area would remain unroaded as settings for motorized and nonmotorized backcountry recreation activities.

This alternative makes achieving a diverse array of recreation opportunities difficult. The vast majority of the unroaded resource (in fact all the areas that have been inventoried as roadless) is recommended for wilderness classification, precluding motorized access. Unroaded areas open to motorized use will be reduced to less than 200,000 acres of the Forest. These are areas that did not meet the inventory criteria and the West Pioneers. The diversity of the wilderness resource on the Forest will be enhanced. All areas of interest to the public from the recreation and roadless resource perspective are recommended for wilderness, with the exception of the West Pioneers which would be managed as nonwilderness with a core recreation management area.

Mineral accessibility in this alternative will be lowest of the range of alternatives considerd. About 66 percent of the Forest will be recommended for withdrawal from mineral entry, and although existing leases and claims would be honored, eventually access will be significantly reduced.

The timber harvest program of Alternative I in the first decade is close to the harvest level of Alternative A but higher than the harvest levels actually experienced over the past few years. Immediate impacts on the local timber industry will be low. Over the long term, however, the timber harvest program is lower than what would be programmed under Alternative A, and eventually the timber industry could be adversely impacted. The livestock industry will be impacted with the potential for AUM's slightly lower than existing. The ways in which permittess used allotments would change within the new Wildernesses, with less reliance on mechanized equipment. Thus it could become more expensive for permittees to utilize National Forest forage. And this could lead to a decline in the local livestock industry. The increase in classified Wilderness could lead to an increase in employment opportunities in the recreation industry--outfitting, sporting goods stores, and so on. However, classification does not necessarily lead to an increase in use, and currently the demand for wilderness recreation is met by the two existing Wilderness areas in the pure capacity sense.

Over time Alternative I would significantly alter existing relationships to the Forest, perhaps more than most other alternatives given the historic patterns for motorized access to the backcountry.

12) **Alternative S**

Alternative S and Sa were built from Alternatives H and Ha respectively, following the public review of the Revised Draft EIS. Alternatives H and Ha were modified to be more responsive to the variety of resource use demands and concerns of the publics who utilize the Beaverhead National Forest lands and resources and to incorporate management concerns about land designations. As a result, Alternative S provides a high level of roadless recreation opportunities as well as recommendations for wilderness classification in some of the inventoried roadless areas receiving highest public support for classification. Wildlife concerns are also addressed through constraints on the spacial and temporal distribution of the timber program. For the same reasons cited in the discussion for Alternative H, Alternative S designates the entire West Pioneer Wilderness Study Area to custodial management, pending a decision by Congress regarding wilderness classification. Because of the constraints imposed to achieve nonpriced objectives, this alternative has the second lowest PNV. The costs are third lowest of the alternatives considered. The discounted benefits associated with this alternative are second lowest, indicating a higher cost for benefits produced than for several of the other alternatives. The PNV of Alternative S is $140 million; discounted costs are $128 million; discounted benefits are $267 million.

The reduction in PNV of implementing Alternative S rather than the maximum PNV benchmark is $158 million. Precluding timber management from 58 percent of tentatively suitable timberland, dispersing timber harvest over the Forest and over time, achieving other wildlife habitat maintenance objectives, and limiting the amount of harvest in mature mixed conifer stands, result in a timber value of only 39 percent of the value in the maximum PNV benchmark. The timber costs are 48 percent less than in the maximum PNV benchmark; road costs are 52 percent less than in the maximum PNV benchmark; however, the timber benefits are 62 percent less. The suitable timber base of Alternative S is 46 percent of the base associated with the maximum PNV benchmark. The long-term sustained yield capacity of Alternative S is 9.3 MMCF, compared to 17.3 MMCF for the maximum PNV benchmark. The reasons for the relatively low PNV of Alternative S are similiar to those associated with Alternative H. This alternative attempts to respond to the variety of resource management demands of the public for timber, wilderness and roadless recreation areas, elk security, diversity, water quality, and fish populations--not all of which contribute priced benefits to any calculations of PNV. Alternative S differs from Alternative H in the degree to which compatibility can be found between nonmarket and market resource management opportunities. In Alternative S there is less opportunity for timber production due to the emphasis placed on other resource values. The tradeoffs of providing nonmarket resources are reflected in the benefit/cost ratio as well as in PNV.

Impacts on big game hunting quality in this alternative are the lowest of the alternatives considered with the exception of alternative D because the objectives of the timber program are to harvest timber only where adequate security for big game populations can be maintained. The harvest level is third lowest of the alternatives considered, providing flexibility to maintain some compatibility between the timber harvest program and wildlife habitat protection. Wildlife constraints are woven into the scheduling of harvest over space and through time wherever timber harvest is scheduled to ensure protection of habitat. The level of harvest and wildlife constraints mean the indices of hunting quality --primarily effective security cover--for this alternative are better than for all other alternatives except alternatives D. The intensity of management activities is less than occurs in several other alternatives, primarily because of the wildlife concerns. Elk hunting opportunities, measured in recreation visitor days, are reduced by decade five but remain highest of the alternatives considered.

Similar to the management objectives for the other alternatives, Alternative S requires use of best management practices and compliance with State of Montana Water Quality standards. Like Alternative H, the wildlife constraints requiring distribution of harvest throughout the suitable timber base provide benefits in water quality also, making it easier to meet State standards. Sale preparation costs may increase over time as the harvest level requires that additional sales be fit into a drainage while protecting both the watershed and wildlife values but not to the degree that they would if the level of timber harvest was higher. This alternative has a timber program that is better distributed than any other alternative. The roads needed for management are relatively few because of the harvest level. The construction needs make meeting State Water Quality Standards difficult but less difficult than for alternatives with higher road construction needs.

In Alternative S, the inventoried roadless lands recommended for wilderness classification are the areas with the highest levels of public support for classification, where conflicts with other resource uses can be minimized, and where compatibility can be achieved with other agency's or Forest's recommendations for contiquous roadless areas. In total, about 16 percent of the Forest would be classified wilderness under this alternative, slightly higher than in Alternative H due to increased acreage in the Italian Peaks being recommended for classification. The acreage that would be assigned management prescriptions that do not call for road construction (thereby staying unroaded and essentially undeveloped) is the highest of the alternatives considered, higher by 100,000 acres than Alternative A (Current Level Management). Although no road construction is scheduled into the 1,116,000 acres, mineral development or the need for access to adjacent areas with scheduled timber harvest could reduce this unroaded acreage.

Alternatives H and S are similiar in that they strive to achieve a diverse and quality recreational setting by maintaining the existing diversity and quality to the greatest extent possible while at the same time responding to emerging new uses and resource concerns. The 1.1 million acres of unroaded lands provide a diverse array of settings for motorized and nonmotorized recreation activities. These unroaded acres also ensure high quality elk habitat security. The wildernesses currently classified and recommended also ensure diverse wilderness recreation opportunities. This alternative proposes a variety of management options for the areas currently inventoried as roadless but not classified as wilderness and of particular interest to the public--Storm Lake, the West Big Hole, East Pioneers, North Big Hole, Snowcrest, West Pioneers, and Tobacco Roots. Storm Lake, Italian Peak, and portions of the East Pioneers and West Big Hole would be recommended for wilderness. The Snowcrest, Tobacco Roots, and some of the West Big Hole and East Pioneers would be designated as recreation management areas and managed to provide opportunities for motorized and nonmotorized recreation in a backcountry envirnoment with no new road construction planned and no timber harvest scheduled. As noted above, the West Pioneers would be held in custodial status.

Mineral accessibility under Alternative S would be low to moderate within the range of alternatives considered, with restrictions imposed in the nonwilderness portions of the Forest responsive to the recreation, visual, and wildlife resource management concerns. Much of this acreage has high to very high favorability for mineral and enerty resources. Areas recommended for wilderness classification would be withdrawn from mineral entry and mineral leasing.

Alternative H will reduce timber harvest levels from the levels programmed in Alternative A (representing the 1978 Land Management Plan) and from the level of Alternative H. The program will be slightly lower than the timber harvest program for the Forest over the past five years. The impact on local employment in the timber industry would be to provide less employment opportunities than currently provided. The livestock industry would generally remain the same as it currently is, with the current potential of AUM's available on National Forest lands.

Over time this alternative would slightly change existing relationships to the Forest. The changes will be less than under all other alternatives. Road construction associated with the timber program will eventually increase public access to the National Forest, but the small suitable timber land base will limit the scope of that change. Within the next ten years, only one percent of the Forest will experience timber management activities and that will be done in a way that maintains elk habitat security. The public's use of the wildlife and fisheries resources on the Forest should be perpetuated in spite of the timber harvest program, although as in all alternatives the environment for hunting and fishing will change somewhat. The large unroaded land base is the main unchanging feature of this alternative, maintaining the recreation environment the public has become accustomed to.

12) **Alternative Sa**

Alternative S and Sa were built from Alternatives H and Ha respectively, following the public review of the Revised Draft EIS. Alternatives H and Ha were modified to be more responsive to expressed public concerns and internal concerns about management. Alternative Sa is identical to Alternative S; however, the West Pioneer Wilderness Study Area is assigned a variety of nonwilderness management prescriptions, including a central core area of roadless recreation management (about 161,000 acres) and 20,000 acres that are designated suitable for timber production. As indicated for Alternative S, Alternative Sa responds to the variety of resource use demands and concerns of the publics who utilize the Beaverhead National Forest lands and resources and draws upon their critique of Alternative Ha in the Revised Draft EIS. As in Alternative S, the liquidation of existing mature sawtimber is limied to 10 percent per decade. Because of the constraints imposed to achieve nonpriced objectives, this alternative has a low PNV but due to the addition of a portion of the West Pioneers to the suitable timber land base, the PNV increases from second lowest for Alternative S to third lowest. The PNV of this alternative is $143 million. Discounted costs are $130 million and discounted benefits are $273 million.

The reduction in PNV of implementing Alternative Sa rather than the maximum PNV benchmark is $155 million. Precluding timber management from 56 percent of tentatively suitable timberland (from 51 percent of the economically suitable as described in the maximum PNV benchmark), dispersing timber harvest over the Forest, achieving other wildlife habitat maintenance objectives, limiting the liquidation of mature mixed conifer stands, result in a timber value of only 40 percent of the value in the maximum PNV benchmark. Still, the timber value of Alternative Sa is 5 percent higher than for Alternative S. The timber costs are $16 million less than in the maximum PNV benchmark; road costs are $15 million less than in the maximum PNV benchmark; however, the timber benefits are $184 million less.

Impacts on big game hunting quality in this alternative are essentially the same as for alternative S but moving the West Pioneers out of custodial management with some timber harvest and road construciotn results in an elk effective cover situation very similiar to alternative I.

The impacts on water quality for Alternative Sa are the same as for Alternative S in that both require use of best management practices and compliance with State of Montana Water Quality standards and have wildlife constraints requiring distribution of harvest throughout the suitable timber base.

Inventoried roadless area management for Alternative Sa is the same as for Alternative S. The only difference is in the West Pioneers, where now a 161,000 acre recreation management emphasis encompasses most of the study area.

The diversity and quality of the recreation setting is the same in Alternative S with the exception of the West Pioneers. In this alternative, recreation will receive a higher emphasis throughout the majority of the area but about 20,000 acres in the area will be scheduled for timber harvest at some time in the planning horizon.

Mineral accessibility under Alternative Sa would be the same as for Alternative S.

Alternative Sa will provide less than 1 MMBF more timber in decade 1 than Alternaitve S and has a long term sustained yield of 2.4 MMBF more. Still, this program is less than in Alternative A. There may be some long term decreases in the employment opportunities in the timber industry. The livestock industry would generally remain the same, maintaining the current potential AUM's on the National Forest.

The impacts of this alternative on the public's relationship to the National Forest would be very similiar to Alternative S.

14) **Alternative W**

Alternative W is very similiar to Alternative F in that it attempts to provide a moderate to high level of commodity resources while at the same time mitigating the impacts of development of the timber resource by incorporating constraints designed to maintain elk security cover. Alternative W differs from Alternative F in that the lands recommended for wilderness classification (appromixately 15 percent of the Forest) are those recommended for classification by the Montana Wildlands Coalition, to the extent that boundary recommendations could be modeled. This alternative ensures that wildlife management prescriptions are assigned to key wildlife areas. Alternative W has the third highest PNV of the alternatives considered but a benefit/cost ratio that is fifth best of the alternatives. As in Alternative F, relatively high costs are involved in attaining the dollar benefits associated with this alternative but the high production level for timber assures a relatively high PNV. The PNV is $207 million. The discounted costs are $149 million and discounted benefits are $357 million.

The reduction in PNV associated with implementation of Alternative W instead of the maximum PNV benchmark is $91 million, lower than is associated with most of the other alternatives. The benefit/cost ratio of Alternative W (2.39) can be compared to the benefit/cost ratio of the maximum PNV benchmark (3.89). The benefit/cost ratio could be improved with the removal of constraints designed to protect the wildlife resource or through an increase in the suitable timber land base. Alternative W has a suitable land base of 615,800 acres, second largest of the alternatives considered. This land base is 76 percent of the tentatively suitable land base and 84 percent of the suitable lands determined to be economically suitable in the maximum PNV benchmark. The large suitable land base and the relatively high level of timber harvested (long-term sustained yield capacity of 11.5 MMCF--35.7 MMBF) contribute to the high PNV.

As in Alternative F, big game hunting quality would be adversely affected by the timber harvest activities and associated road construction program of this alternative but the wildlife habitat protection constraints incorporated into the alternataive, requiring a broad distribution of harvest in space and over time within the wildlife emphasis prescriptions, ensure that adverse impacts are reduced from what they might be. Still, the level of harvest means the indices of hunting quality--primarily effective security cover--for this alternative are worse than for alternatives with lower timber harvest programs, such as Alternative D. The intensity of management activities is less than occurs in several other alternatives, again because special efforts are made to distribute the harvest over space and in time. Elk hunting opportunities, measured in recreation visitor days, are reduced by decade five to the same level that would occur with implementation of Alternative A; however, by incorporating wildlife concerns in the timber program, Alternative W is able to sustain a long-term yield 4.4 MMBF higher than Alternative A with no greater impacts on hunting opportunities.

Alternative W is like all other alternatives in that it requires use of best management practices and compliance with State of Montana Water Quality standards. Although the timber harvest program is well distributed over the suitable timber base as a result of the wildlife constraints, the level of harvest means more difficulty in minimizing the potential for stream sedimentation. Sale preparation costs may increase over time as the harvest level requires that additional sales be fit into a drainage while protecting both the watershed and wildlife values. The roads needed for management are among the highest of the alternatives considered. This is because of the distribution requirement impacting the timber program. The construction needs make meeting State Water Quality Standards difficult.

About 25 percent of the existing inventoried roadless acres are recommended for wilderness classification under Alternative W. Unroaded area management for the remainder of the Forest is reduced from the million acres that would exist under the 1978 Land Management Plan (Alternative A) to about 784,000 acres. Although no road construction is scheduled into those acres, mineral development or the need for access to adjacent areas with scheduled timber harvest could further reduce this unroaded and undeveloped acreage.

Achievement of a diverse and quality recreational setting under this alternative should be achievable. The majority of the Forest would remain unroaded but without wilderness classification, providing a variety of motorized and nonmotorized nonwilderness recreational opportunities. One third of the Forest would be developed with the suitable timber land base. About 500,000 acres would be classified wilderness. This alternative proposes a variety of management options for the areas currently inventoried as roadless but not classified as wilderness and of particular interest to the public. Some of the West Big Hole, East Pioneers, North Big Hole, and Tobacco Roots--are recommended for wilderness classification, eroding the motorized opportunities in these areas to some extent but not to the extent of Alternatives C and D. The remainder of these areas, the Snowcrest, and a core area of the West Pioneers would be managed to provide nonwilderness but unroaded recreation.

Mineral accessibility under Alternative W would be similiar to Alternative F, with restrictions primarily related to wildlife habitat protection constraints or to the withdrawals that would be associated with the recommendations for wilderness classification. Mineral exploration and development activities could lead to the roading of unroaded areas; so long as constraints imposed for wildlife habitat protection and recreation management concerns were meet.

Alternative W increases timber harvest levels slightly more than Alternative F does and could impact the local employment in the timber industry providing opportunities greater than currently provided. The role of the timber industry in the area could significantly increase in the short term but the long-term increases would be somewhat less significant because the long-term sustained yield capacity of Alternative W is only 4.4 MMBF greater than Alternative A (Current Level of Management). The livestock industry would generally remain the same as it currently is, with slightly more potential AUM's available on National Forest lands. This alternative would have some positive impacts on economic stability because of the timber program and because an effort is made to maintain other resource values that contribute directly and indirectly to the economic base such as wildlife habitat.

Existing relationships to the Forest would be changed over time under this alternative in much the same way as Alternative F. Road construction is extensive and the suitable timber land base is large, indicating that significant increases in public access would occur over time. The public's use of the wildlife resource on the Forest would be perpetuated, but the environment for hunting and fishing would be changed. The role of timber in the local economy and in people's lifestyles could change.

Table II-20

Resource Allocation and Average Annual Outputs

Resource	Unit of Measure	1980	A	B	C	D	F	G	H	HA	H(DEPT)	I	W	Min Level	Max PNW	S	SA
Developed Recreation Use	M RVD*																
Decade 1			190.1	190.1	190.1	190.1	190.1	190.1	190.1	190.1	190.1	190.1	190.1	0	190.1	190.1	190.1
Decade 3			284.8	284.8	284.8	284.8	284.8	284.8	284.8	284.8	284.8	284.8	284.8	0	284.8	284.8	284.8
Decade 5			379.0	379.0	379.0	379.0	379.0	379.0	379.0	379.0	379.0	379.0	379.0	0	379.0	379.0	379.0
Decade 10			379.0	379.0	379.0	379.0	379.0	379.0	379.0	379.0	379.0	379.0	379.0	0	379.0	379.0	379.0
Decade 15			379.0	379.0	379.0	379.0	379.0	379.0	379.0	379.0	379.0	379.0	379.0	0	379.0	379.0	379.0
Dispersed Recreation Use Type I	M RVD*																
Decade 1			41.7	41.7	41.7	41.7	41.7	41.7	41.7	41.7	41.7	41.7	41.7	41.7	41.7	41.7	41.7
Decade 3			53.7	53.7	53.7	53.7	53.7	53.7	53.7	53.7	53.7	53.7	53.7	41.7	53.7	53.7	53.7
Decade 5			65.8	65.8	65.8	65.8	65.8	65.8	65.8	65.8	65.8	65.8	65.8	41.7	65.8	65.8	65.8
Decade 10			65.8	65.8	65.8	65.8	65.8	65.8	65.8	65.8	65.8	65.8	65.8	41.7	65.8	65.8	65.8
Decade 15			65.8	65.8	65.8	65.8	65.8	65.8	65.8	65.8	65.8	65.8	65.8	41.7	65.8	65.8	65.8
Dispersed Recreation Use Type II	M RVD*																
Decade 1			127.7	127.7	127.7	127.7	127.7	127.7	127.7	127.7	127.7	127.7	127.7	127.7	127.7	127.7	127.7
Decade 3			164.8	164.8	164.8	164.8	164.8	164.8	164.8	164.8	164.8	164.8	164.8	143.3	164.8	164.8	164.8
Decade 5			201.8	201.8	201.8	201.8	201.8	201.8	201.8	201.8	201.8	201.8	201.8	143.3	201.8	201.8	201.8
Decade 10			201.8	201.8	201.8	201.8	201.8	201.8	201.8	201.8	201.8	201.8	201.8	143.3	201.8	201.8	201.8
Decade 15			201.8	201.8	201.8	201.8	201.8	201.8	201.8	201.8	201.8	201.8	201.8	143.3	201.8	201.8	201.8
Dispersed Recreation Use Type III	M RVD*																
Decade 1			174.8	174.8	174.8	174.8	174.8	174.8	174.8	174.8	174.8	174.8	174.8	174.8	174.8	174.8	174.8
Decade 3			239.4	239.4	239.4	239.4	239.4	239.4	239.4	239.4	239.4	239.4	239.4	0	239.4	239.4	239.4
Decade 5			303.9	303.9	303.9	303.9	303.9	303.9	303.9	303.9	303.9	303.9	303.9	0	303.9	303.9	303.9
Decade 10			303.9	303.9	303.9	303.9	303.9	303.9	303.9	303.9	303.9	303.9	303.9	0	303.9	303.9	303.9
Decade 15			303.9	303.9	303.9	303.9	303.9	303.9	303.9	303.9	303.9	303.9	303.9	0	303.9	303.9	303.9
Wilderness Recreation Use	M RVD *																
Decade 1		20.9	21.7	21.7	21.7	21.7	21.7	21.7	21.7	21.7	21.7	21.7	21.7	21.7	21.7	21.7	21.7
Decade 3			25.9	25.9	25.9	25.9	25.9	25.9	25.9	25.9	25.9	25.9	25.9	25.9	25.9	25.9	25.9
Decade 5			35.7	35.7	35.7	35.7	35.7	35.7	35.7	35.7	35.7	35.7	35.7	35.7	35.7	35.7	35.7
Decade 10			35.7	35.7	35.7	35.7	35.7	35.7	35.7	35.7	35.7	35.7	35.7	35.7	35.7	35.7	35.7
Decade 15			35.7	35.7	35.7	35.7	35.7	35.7	35.7	35.7	35.7	35.7	35.7	35.7	35.7	35.7	35.7
Elk Hunting Potential	M RVD/yr																
Decade 1			65.8	63.8	65.1	65.8	65.8	65.8	65.8	65.8	65.1	66.4	63.8	66.4	63.8	65.6	66.4
Decade 3			63.1	61.1	62.4	63.8	62.4	62.4	63.1	62.4	61.1	63.1	62.4	66.4	60.4	63.9	63.9
Decade 5			62.4	59.8	60.4	63.8	62.4	61.1	62.4	60.4	61.1	63.8	62.4	66.4	59.8	63.9	63.0
Wilderness Management **	M Acres	72.5	337.7	173.5	1107.2	945.9	620.2	235.5	337.3	337.3	337.3	1415.6	488.8	173.5	173.5	342.9	342.9

* Only projected recreation use is displayed.

** Wilderness management acres have been increased by 10,000 acres to reflect the land exchange which resulted from the Lee Metcalf Wilderness Bill. Refinement of specific wilderness boundaries may result in adjustments to these acres.

Table II-20, continued

Resource	Unit of Measure	1980	Alternatives														
			A	B	C	D	F	G	H	HA	H(DEPT)	I	W	Min Level	Max PNW	S	SA
Roadless Management	M Acres		1000.4	1044.9	280.7	670.0	656.4	1051.3	1115.8	1060.6	1115.8	173.5	784.0	1544.0	989.0	1136.4	1114.4
Old Growth on Suitable Timberlands in 100 Years	%		19	8	6	30	26	9	9	11	7	10	26	0	10	8	9
Wildlife Habitat Improvements All decades	M$		0	24.6	.5	18.4	65.6	20.8	14.4	14.4	14.4	.1	68.6			14.8	14.8
Wildlife Habitat Maintenance All decades	M$		0	10.2	1.3	4.7	14.8	11.6	15.1	15.1	15.1	4.9	16.0			15.6	15.8
Elk Effective Cover	M Acres																
Decade 1		1180	1114	1099	1118	1140	1098	1105	1128	1116	1111	1136	1097			1140	1139
Decade 3			1015	958	988	1086	989	993	1044	1015	982	1062	988			1072	1069
Decade 5			973	887	921	1078	982	971	1005	975	965	1038	983			1040	1037
Catchable Trout (Streams)	M Fish																
Decade 1			334.0	334.8	334.4	337.1	334.0	335.1	337.8	336.6	336.6	337.8	334.0			337.9	337.9
Decade 3			329.8	335.5	330.3	337.8	334.0	332.6	339.4	339.1	335.0	339.8	334.0			341.1	341.1
Decade 5			326.5	331.5	326.6	335.6	330.7	329.3	336.9	335.8	334.0	337.2	330.7			341.1	339.8
Range Structural Improvements All decades	M$		152.0	147.2	146.4	148.8	153.6	148.0	154.4	154.4	154.4	144.0	156.0			152.0	151.2
Range Nonstructural Improvements All decades	M$		74.5	84.5	72.4	75.4	82.3	86.1	89.9	89.9	89.9	77.4	86.0			87.2	86.9
Potential Range Forage	M AUM's/yr																
Decade 1		190	190	184	182	186	192	185	192	191	199	178	195	144	180	190	189
Decade 3			191	205	205	186	191	188	195	193	202	182	193	0	196	191	191
Decade 5			201	206	210	189	202	195	209	208	198	189	203	0	201	194	193
Decade 10			193	185	184	184	187	188	192	191	201	180	190	0	182	192	191
Decade 15			197	202	202	184	187	199	193	189	194	190	190	0	196	191	190
Base Timber Sale Schedule	MMBF/yr*																
Decade 1		28	29.4	33.8	25.8	18.8	36.2	43.6	20.6	23.8	31.6	28.2	37.6	0	55.4	17.3	18.1
Decade 3			35.6	48.7	37.4	18.8	36.2	43.6	26.1	29.1	35.6	28.2	37.6	0	55.4	23.4	24.4
Decade 5			35.6	50.8	40.9	18.8	36.2	43.6	26.1	29.1	31.6	28.2	37.6	0	55.4	24.1	25.4
Decade 10			28.1	47.6	40.9	15.4	30.5	35.6	27.9	32.2	36.2	22.4	30.8	0	46.7	23.8	24.8
Decade 15			31.3	52.5	43.7	19.8	37.6	42.6	32.4	36.4	33.9	26.6	39.1	0	53.6	31.0	34.5

* Apparent departures from nondeclining flow are actually due to conversion from cubic foot volumes to board foot volumes.

Table II-20, continued

			Alternatives														
Resource	Unit of Measure	1980	A	B	C	D	F	G	H	HA	H(DEPT)	I	W	Min Level	Max PNW	S	SA
Base Timber Sale Schedule	MMCF/yr																
Decade 1			8.9	10.9	8.9	5.7	11.3	13.2	7.1	8.5	11.3	8.3	11.4	0	17.3	5.8	6.1
Decade 3			10.8	15.7	12.9	5.7	11.3	13.2	9.0	10.4	12.7	8.3	11.4	0	17.3	7.9	8.2
Decade 5			10.8	16.4	14.1	5.7	11.3	13.2	9.0	10.4	11.3	8.3	11.4	0	17.3	8.1	8.6
Decade 10			10.8	16.4	14.1	5.7	11.3	13.2	9.0	10.4	11.3	8.3	11.4	0	17.3	8.1	8.6
Decade 15			10.8	16.4	14.1	6.0	11.4	13.3	9.0	10.4	11.3	8.3	11.5	0	17.3	9.0	9.8
Long Term Sustained Timber Yield	MMBF		31.3	49.2	42.3	18.6	35.3	41.2	33.3	37.1	40.2	25.7	35.7	0	51.9	32.1	34.5
Long Term Sustained Timber Yield	MMCF		10.8	16.4	14.1	6.0	11.4	13.3	10.4	11.6	13.4	8.3	11.5	0	17.3	9.3	9.8
Suitable Timber Land	M Acres		535.3	652.5	537.2	313.1	609.3	547.6	378.5	433.7	378.5	347.1	615.8	0	730.6	338.3	360.3
Reforestation	Acres/yr																
Decade 1			882	941	1021	966	457	919	801	1060	890	257	454	0	517	736	748
Decade 3			1951	1028	3667	671	292	650	517	559	533	142	305	0	374	343	359
Decade 5			457	280	373	232	325	33	400	390	594	32	326	0	44	239	224
Timber Stand Improvement	Acres/yr																
Decade 1		50	78	656	523	419	419	656	435	435	435	517	419	0	523	435	435
Decade 3			276	3631	4112	610	1642	4056	2972	3767	3869	2568	1652	0	5172	2715	2840
Decade 5			1760	7761	7070	671	631	3224	3991	4588	4338	1421	708	0	3743	2799	2924
Additional Roads needed for Management	Miles		3550	4324	3570	1965	4103	3550	2452	2929	2490	2225	4154	0	4970	2143	2302
Road Construction (total)	Miles/yr																
Decade 1			52.4	63.5	53.3	29.7	60.6	53.3	37.8	45.0	43.6	33.2	61.0	0	72.1	33.8	35.9
Decade 3			43.2	52.7	43.4	23.6	50.0	43.2	29.7	35.5	39.2	26.9	50.6	0	60.7	25.9	27.8
Decade 5			36.5	44.6	36.7	20.1	42.3	36.4	25.0	29.9	29.3	22.8	42.9	0	51.4	21.7	23.4
Decade 10			22.9	28.0	23.0	12.6	26.5	22.8	15.6	18.6	17.9	14.3	26.9	0	32.3	13.5	14.6
Decade 15			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Local Forest-related Employment	Jobs																
Decade 1			1072	1135	1053	930	1180	1266	973	1018	1121	1041	1201	620	1411	928	938
Decade 3			1329	1535	1417	1096	1344	1441	1153	1202	1352	1219	1364	234	1600	1183	1197
Local Forest-related Income	MM$																
Decade 1			19	20	18	16	21	23	16	17	20	18	22	10	26	16	16
Decade 3			23	27	25	18	23	26	19	20	24	21	24	3	29	20	20
Total Costs	M$/yr.																
Decade 1			5246	5850	6566	4737	6113	5862	5079	5368	5573	4705	6163	2938	6135	4965	5030
Decade 3			5430	6675	7582	4548	5840	5919	5334	5635	5912	4835	5893	2790	6290	5167	5254
Decade 5			5344	6996	7350	4604	5821	5781	5677	6096	6125	4816	5866	2883	6247	5283	5375
Decade 10			5056	5361	6074	4604	5685	5309	4697	4877	5025	4410	5709	2883	5444	4840	4887
Decade 15			4740	5598	6367	4081	4829	5036	4481	4630	4861	4367	4842	2883	5126	4547	4628

Table II-20, continued

Resource	Unit of Measure	1980	Alternatives														
			A	B	C	D	F	G	H	HA	H(DEPT)	I	W	Min Level	Max PNW	S	SA
Recreation Costs	M$/yr.																
Developed																	
Decade 1			188	188	188	188	188	188	188	188	188	188	188	188	188	188	188
Decade 3			282	282	282	282	282	282	282	282	282	282	282	282	282	282	282
Decade 5			375	375	375	375	375	375	375	375	375	375	375	375	375	375	375
Decade 10			375	375	375	375	375	375	375	375	375	375	375	375	375	375	375
Decade 15			375	375	375	375	375	375	375	375	375	375	375	375	375	375	375
Range Costs	M$/yr.																
Decade 1			319	309	307	313	322	310	323	321	334	299	327	242	302	319	318
Decade 3			320	345	345	312	321	316	327	324	339	307	325	0	329	321	320
Decade 5			338	345	352	318	339	328	351	348	333	317	341	0	338	326	325
Decade 10			323	310	309	309	314	316	323	320	338	303	319	0	306	323	322
Decade 15			330	340	339	309	315	334	324	317	326	319	320	0	329	320	319
Timber Costs	M$/yr.																
Decade 1			759	880	761	569	1036	1073	629	739	985	545	1059	0	1116	554	576
Decade 3			1119	1831	1884	450	973	1346	1005	1172	1385	768	991	0	1504	891	938
Decade 5			1028	2243	1707	478	995	1201	1294	1592	1667	696	1004	0	1482	970	1027
Decade 10			981	932	726	595	1144	994	520	618	777	461	1126	0	1084	678	701
Decade 15			1020	1589	1346	287	752	1080	577	738	943	638	741	0	1253	603	680
Other Costs	M$/yr.																
Decade 1			2863	3148	4154	2987	3277	3158	3085	3125	3124	2933	3299	2508	3047	3114	3124
Decade 3			2849	3192	4197	2991	3272	3129	3103	3139	3142	2908	3296	2508	3005	3117	3127
Decade 5			2861	3151	4164	2980	3258	3150	3122	3162	3149	2929	3285	2508	3046	3128	3138
Decade 10			2867	3147	4148	2997	3273	3125	3101	3135	3122	2914	3305	2508	3003	3118	3127
Decade 15			2880	3155	4169	2983	3248	3108	3070	3061	3062	2908	3268	2508	3030	3114	3119
Road Costs*	M$/yr.																
Decade 1			1117	1325	1156	680	1290	1133	854	995	942	740	1290	0	1482	790	824
Decade 3			860	1025	874	513	992	846	617	718	764	570	999	0	1170	556	587
Decade 5			742	882	752	453	854	727	535	619	601	499	861	0	1006	484	510
Decade 10			510	597	516	328	579	499	378	429	413	357	584	0	676	346	362
Decade 15			135	139	138	127	139	139	135	139	135	127	138	0	139	135	135
Purchaser Credit																	
Road Costs	M$/yr.																
Decade 1			742	903	744	395	868	711	479	573	567	455	881	0	1060	415	449
Decade 3			691	843	695	368	810	663	448	536	595	425	821	0	988	387	418
Decade 5			589	720	593	316	692	565	382	457	448	362	702	0	844	331	357
Decade 10			375	458	378	201	440	360	243	290	278	230	446	0	537	211	227
Decade 15			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Capital Investment																	
Road Costs	M$/yr.																
Decade 1			375	422	412	285	422	422	375	422	375	285	409	0	422	375	375
Decade 3			169	182	179	145	182	183	169	182	169	145	178	0	182	169	169
Decade 5			153	162	159	137	162	162	153	162	153	137	159	0	162	153	153
Decade 10			135	139	138	127	139	139	135	139	135	127	138	0	139	135	135
Decade 15			135	139	138	127	139	139	135	139	135	127	138	0	139	135	135

* Road costs are the total of purchaser credit and capital investment road costs.

Table II-20, continued

Resource	Unit of Measure	1980	Alternatives														
			A	B	C	D	F	G	H	HA	H(DEPT)	I	W	Min Level	Max PNW	S	SA
Total Capital Investment Costs	M$/yr.																
Decade 1			375	422	412	285	422	422	375	422	375	285	409	0	422	375	375
Decade 3			169	182	179	145	182	183	169	182	169	145	178	0	182	169	169
Decade 5			153	162	159	137	162	162	153	162	153	137	159	0	162	153	153
Decade 10			135	139	138	127	139	139	135	139	135	127	138	0	139	135	135
Decade 15			135	139	138	127	139	139	135	139	135	127	138	0	139	135	135
Operation/Maintenance Costs	M$/yr.																
Decade 1			4129	4521	5410	4057	4823	4729	4225	4373	4631	3965	4873	2938	4653	4175	4206
Decade 3			4570	5650	6708	4035	4848	5073	4717	4917	5148	4265	4894	2790	5120	4611	4667
Decade 5			4602	6114	6598	4151	4967	5054	5142	5477	5524	4317	5005	2883	5241	4799	4865
Decade 10			4546	4764	5558	4276	5106	4810	4319	4448	4612	4053	5125	2883	4768	4494	4525
Decade 15			4605	5459	6229	3954	4690	4897	4346	4491	4706	4240	4704	2883	4987	4412	4493
Return to U.S. Treasury	M$/yr																
Decade 1			5664	5327	3300	3850	6890	7122	2956	3368	4175	4521	7202	225	9344	2383	2476
Decade 3			9042	10854	8882	4291	8071	11489	5350	6066	7219	7253	8262	19	14142	5821	6020
Decade 5			11141	20778	17824	5917	10887	18758	11929	13170	12907	12082	11719	19	24420	8070	8552
Decade 10			9222	17581	15232	5060	9404	14422	9626	10923	10164	9344	9691	19	19350	9344	9963
Decade 15			11052	16917	12654	8804	15326	14423	11330	12282	11212	8615	15585	19	17224	11035	11745
Return to States	M$/yr																
Decade 1			1416	1332	825	962	1722	1780	739	842	1044	1130	1800	56	2336	596	619
Decade 3			2261	2714	2221	1073	2018	2872	1337	1516	1805	1813	2065	5	3536	1455	1505
Decade 5			2785	5194	4456	1479	2722	4689	2982	3292	3227	3021	2930	5	6105	2018	2138
Decade 10			2305	4395	3808	1265	2351	3605	2406	2730	2541	2336	2423	5	4838	2336	2491
Decade 15			2763	4229	3163	2201	3832	3606	2832	3070	2803	2154	3896	5	4306	2759	2936
Special Use Returns	M$/yr																
Decade 1			19	19	19	19	19	19	19	19	19	19	19	19	19	19	19
Decade 3			19	19	19	19	19	19	19	19	19	19	19	19	19	19	19
Decade 5			19	19	19	19	19	19	19	19	19	19	19	19	19	19	19
Decade 10			19	19	19	19	19	19	19	19	19	19	19	19	19	19	19
Decade 15			19	19	19	19	19	19	19	19	19	19	19	19	19	19	19
Range Returns	M$/yr																
Decade 1			272	263	260	266	275	265	275	274	285	255	279	206	257	272	270
Decade 3			273	293	293	266	273	269	279	276	289	260	276	0	280	273	273
Decade 5			287	295	300	270	289	279	299	298	283	270	290	0	287	277	276
Decade 10			276	265	263	263	267	269	275	274	287	257	272	0	260	275	273
Decade 15			282	289	289	263	267	285	276	270	277	272	272	0	280	273	272
Timber Returns	M$/yr																
Decade 1			5373	5045	3021	3565	6596	6838	2662	3075	3871	4247	6904	0	9068	2092	2187
Decade 3			8750	10542	8570	4006	7779	11201	5052	5771	6911	6974	7967	0	13843	5529	5728
Decade 5			10835	20464	17505	5628	10579	18460	11611	12853	12605	11793	11410	0	24114	7774	8257
Decade 10			8927	17297	14950	4778	9118	14134	9332	10630	9858	9068	9400	0	19071	9050	9671
Decade 15			10751	16609	12346	8522	15040	14119	11035	11993	10916	8324	15294	0	16925	10743	11454

Table II-20, continued

Resource	Unit of Measure	1980	Alternatives													
			A	B	C	D	F	G	H	HA	H(DEPT)	I	W	Min Level	Max PNV	S	SA
Market Resource Benefits	M$/yr																
Decade 1			7581	7204	5167	5745	8819	9001	4891	5292	6156	6356	9154	2153	11191	4299	4388
Decade 3			11410	13328	11356	6624	10445	13844	7749	8453	9669	9567	10654	1036	16550	8197	8389
Decade 5			14275	23942	21017	8965	14026	21849	15115	16342	16018	15125	14864	1724	27553	11153	11631
Decade 10			12292	20595	18242	8072	12436	17461	12696	13981	13298	12328	12743	1724	22349	12413	13028
Decade 15			14152	20057	15792	11816	18362	17536	14403	15324	14293	11666	18640	1724	20320	14093	14795
Nonmarket Resource Benefits	M$/yr																
Decade 1			2111	2111	2111	2111	2111	2111	2111	2111	2111	2111	2111	2111	2111	2111	2111
Decade 3			3303	3303	3303	3303	3303	3303	3303	3303	3303	3303	3303	1316	3303	3303	3303
Decade 5			5224	5224	5224	5224	5224	5224	5224	5224	5224	5224	5224	1755	5224	5224	5224
Decade 10			5224	5224	5224	5224	5224	5224	5224	5224	5224	5224	5224	1755	5224	5224	5224
Decade 15			5224	5224	5224	5224	5224	5224	5224	5224	5224	5224	5224	1755	5224	5224	5224
Costs discounted at 4%	MM$																
Developed Recreation			7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
Range			8	8	8	8	8	8	8	8	8	8	8	2	8	8	8
Timber			23	36	31	13	25	30	22	26	28	17	25	0	36	19	20
Roads			23	27	23	14	26	23	17	20	19	15	26	0	31	15	16
Other			72	80	105	75	83	79	78	79	79	74	83	63	76	79	79
Benefits Discounted at 4%	MM$																
Recreation/Wildlife			106	106	106	106	106	106	106	106	106	106	106	68	106	106	106
Range			42	42	42	40	42	41	42	42	43	39	42	13	41	41	41
Timber			181	253	196	106	200	249	140	159	163	154	208	0	309	119	125
Other			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Present Value Benefits (4%)	MM$		329	401	344	253	348	396	289	307	313	300	357	81	456	267	273
Present Value Costs (4%)	MM$		133	158	174	117	148	146	132	139	141	120	149	72	158	128	130
Present Net Value (4%)	MM$		196	244	170	136	200	249	157	168	172	180	207	9	298	140	143
Opportunity Cost* (4%)	MM$		102	54	128	162	98	49	141	130	126	118	91	289	0	158	155
Benefit/Cost Ratio (4%)			2.47	2.55	1.98	2.17	2.35	2.70	2.19	2.21	2.22	2.50	2.39	1.13	2.89	2.10	2.11
Present Value Benefits (7 1/8%)	MM$		162	185	152	126	174	193	134	142	153	148	179	48	225	124	126
Present Value Costs (7 1/8%)	MM$		75	87	97	66	84	83	74	78	80	67	85	41	88	71	72
Present Net Value (7 1/8%)	MM$		87	97	55	60	90	110	60	64	73	80	94	7	137	52	53

* Opportunity costs are estimated from the maximum PNV benchmark.

Table II-20, continued

Resource	Unit of Measure	1980	Alternatives A	B	C	D	F	G	H	HA	H(DEPT)	I	W	Min Level	Max PNV	S	SA
Research Natural Areas	Acres		1429	1429	1429	1429	1429	1429	1429	1429	1429	1429	1429	1429	1429	1429	1429
Forest Work Force	Wk/Yr Equiv.																
Decade 1		170	161	158	154	153	166	161	158	158	161	158	167			155	156
Decade 3			163	171	167	153	166	162	159	163	163	158	167			158	159
Decade 5			165	171	169	156	169	167	161	165	165	161	169			158	159

CHAPTER III

III. AFFECTED ENVIRONMENT (Chapter III)

This chapter describes the environment that may be changed by the implementation of the Proposed Action or alternative plans considered. This description is presented in two sections. Section A describes the physical, biological, social, and economic settings and Section B describes the Forest's current resource situations. Most of the resource discussion focuses on the nonwilderness portion of the Forest.

Summary of changes between the Revised Draft and Final EIS

In conjunction with the recent designation of the Lee Metcalf Wilderness, the Forest participated in a land exchange with several private land owners. This exchange was designed to consolidate ownerships and facilitate the management of the Wilderness resources. These exchanges increased the total acres included in the Taylor-Hilgard portion of the Wilderness and increased total National Forest acres.

The air section of Chapter III [illegible] has been expanded to [illegible] of management concerns and the public comments received on the Revised Draft EIS.

A discussion of the [illegible] National Forest. [illegible] has been added to clarify the coordination that [illegible] between [illegible] regarding this issue.

The Forest has evaluated a number of new sites as possible additions to the Research Natural Area system. Five new areas are listed as proposed, and five others listed as candidates. These areas will be further evaluated before final designation.

Portions of the Forest are included in the Greater Yellowstone Area. This inclusion has been recognized.

Four new wildlife species [illegible] added as [illegible] to [illegible] of [illegible] by the Forest. [illegible]

Potential [illegible] for [illegible] separately. This [illegible] impacts.

Discussions of existing situations [illegible] and use of Best Management Practices (BMP's) in the management of [illegible].

The oil and gas drilling in the [illegible] Mountains [illegible]. The [illegible] and access road are constructed and drilling operations have commenced. An additional drilling application has been received for another location in the same area.

The Nee-Me-Poo trail on the Gardiner Ranger District has been proposed as a National Historic Trail. Final designation is pending for approval.

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Summary of changes between the Revised Draft and Final EIS

In conjunction with the recent designation of the Lee Mectcalf Wilderness, the Forest participated in a land exchange with several private land owners. This exchange was designed to consolidate ownerships and facilitate the management of the Wilderness resource. These exchanges increased the total acres included in the Beaverhead portion of the Wilderness, and increased total National Forest acres.

The discussion of timber sale economics has been expanded in recognition of management concerns and the public comments received on the Revised Draft EIS.

A discussion of the relationships between National Forests' timber supplies has been added to clarify the coordination that has occurred between National Forests regarding this topic.

The Forest has evaluated a number of new sites as possible inclusions to the Research Natural Area system. Five new areas are listed as proposed, and five areas listed as candidates. These areas will be further evaluated before final designation.

Portions of the Forest are included in the Greater Yellowstone Area. This inclusion has been recognized.

Four new wildlife species are added as indicator species to evaluate the overall condition of various habitat conponents occurring on the Forest. Pine martin is included for evaluation of oldgrowth Spruce/Fir habitats, trumpeter swan for marshland communities and arctic grayling and cutthroat trout for cold water fisheries.

Potential fishery habitat for lake and stream fisheries has been displayed separately. This is done for consistency with evaluation procedures and projected impacts.

Discussions of existing situations assume the continued use of Best Management Practices (BMPs) in the management of those resources.

The oil and gas drillsite in the Tendoy Mountains is proceding. The drill pad and access road are constructed and drilling operations have commenced. An additional drillsite application has been recieved for another location in the same area.

The Nee-Me-Poo trail on the Wisdom Ranger District has been proposed as a National Historic Trail. Final designation is pending but expected.

Population figures for the five counties included in the planning area have been updated to display the number of minorities living in those areas.

The discussion of livestock range has been expanded to show the acres of suitable rangeland which is closed to livestock grazing, and the percentage of rangeland which is in good or better range condition.

The discussion of nongame wildlife species and dependent habitat occuring on the Forest has been expanded.

Numerous editorial changes have been made. These changes are designed to clarify the discussions without altering the intended content.

A. Physical, Biological, Social, and Economic Settings

1. General Setting

The Forest is located in the southwest portion of Montana just east of the Continental Divide and is included in Beaverhead, Madison, Silver Bow, Deer Lodge, and Gallatin Counties. The land area confined within the Forest protection boundary comprises approximately 2,218,683 acres, of which approximately 70,000 acres are in other than Forest Service jurisdiction, including State of Montana, Bureau of Land Management, and private.

The north, west, and south edges of the Forest are defined by the mountains of the Continental Divide including the Anaconda-Pintler, Bitterroot, and Beaverhead Mountain Ranges. The eastern edge of the Forest is defined by the Madison and Tobacco Root Mountain Ranges. Interior mountain ranges include the Gravelly, Snowcrest, Fleecer, Greenwood, Tendoy, and the Pioneer Mountains. These mountains provide a wide variety of topographic characteristics.

Portions of the Madison and Gravelly Ranges are included in the Greater Yellowstone Area. This area includes portions of a number of National Forests in Montana, Wyoming and Idaho, as well as Yellowstone and Grand Teton National Parks, Bureau of Land Management, and the Red Rock Lakes National Wildlife Refuge.

The Forest is divided into seven relatively isolated parcels identified as planning areas. These planning areas are: Madison, Gravelly, Tobacco Roots, Pioneers, West Big Hole, Fleecers, and Lima.

The Forest is relatively undeveloped. Approximately 66 percent of the Forest remains unroaded or accessed only by jeep trails and meets the criteria for consideration for wilderness designation. Major local industries include farming, ranching, and tourism.

2. Physical Setting

a. Topography

The Beaverhead National Forest encompasses a widely diverse topographic setting ranging from wide open valley bottoms and sage covered foothills, to tall highly glaciated mountain peaks ranging to 11,000 feet in elevation.

The mid-elevations are characterized by relatively gentle slopes. Approximately 80 percent of the potentially suitable forest stands occur on slopes less than 45 percent.

The lower elevations are characterized by the wide river valleys of the Beaverhead, Big Hole, Madison, Ruby, Red Rock and Wise Rivers.

The opportunities for and consequences of Forest management are greatly influenced by slope. Generally, lands with gentle slopes are the most productive for many resources including recreation, wildlife, and timber. They are the least costly to manage, allow the greatest range of management practices, and offer the widest range of management opportunities with the lowest potential to adversely affect other values. As slopes increase, management costs escalate, the potential for adverse impacts increases, and the range of management practices becomes restricted.

b. Climate

The winter climate on the Forest is relatively cold and dry. The Continental Divide bordering the western edge blocks much of the moist weather systems from the Pacific Ocean. Winter temperatures of 50 degrees below zero are not uncommon.

The summer climate is relatively cool and dry. Temperatures can range up to 100 degrees in the lower elevations but are not sustained for long periods. The average growing season is short, ranging from 30 days in the upper elevations to 150 days in the lower valleys.

Annual precipitation ranges from 12 inches in the lower valleys to over 50 inches in the mountains. Three-fourths of the moisture received on the Forest occurs as snow between October and April.

c. Visual Setting

Much of the Forest maintains a natural or near-natural appearance. The highest category for classifying existing visual condition (EVC) of forest landscapes is "untouched". Eighty percent of the forest meets the criteria of this category.

Several major travel corridors are located adjacent to the Forest, including Interstate #15, U.S. Highway #287 and #91 and several paved State highways from which the Forest is viewed. Due to the small amount of development on the Forest, evidence of management is not often seen from these viewing points. Severe visual impacts to the natural appearance are timber harvest units cut in the previous two decades, hard rock mineral developments, and roading associated with these two activities.

d. Geology

The geology of the Forest is very diverse. A wide range of rock ages and types occur, from oldest crystalline metamorphic rocks, to younger sediments. Considerable volumes of igneous rocks (granite) intrude these country rocks in several locations. Young volcanic rocks (rock composed of lava and ash) also occur. Structural deformation of the entire Forest, including uplift, folding, and faulting has been intense and continues today. Episodes of mountain building (uplift) and erosion have occurred and recurred over long periods of time. Mountain building is still very active in the Madison and Centennial Ranges, and can be "seen" through active fault scarps and frequent earthquakes. Many of the high elevation mountain ranges have been extensively glaciated.

3. Biologic Setting

This section describes general vegetative categories on the Forest and threatened and endangered plants.

a. Vegetation

Due to the drier climate, the Forest does not contain the great diversity of plant species found on the west side of the Continental Divide. Conifer tree species occurring in significant amounts include lodgepole pine, Douglas-fir, Engelmann Spruce, whitebark pine, and subalpine fir. Ponderosa pine occurs occasionally on the west side of the Forest but not in significant amounts. Alpine larch occurs in the higher elevations, but is not considered a commercial species.

There are no plant species occuring on the Forest classified as threatened or endangered Penstemon lemhiensis may occur on the Forest and is listed as a species that is considered as appropriate for listing as endangered or threatened. (Peterson, 1983).

Six major vegetative communities occur on the Forest:

Riparian - areas occur along streams and wet meadows. These areas are very diverse across the Forest ranging from open meadows characterized by wet site forbs and grasses to dense stands of mature Engelmann spruce.

Grasslands - occur in the lower elevations, and are dominated by natural range species such as fescue, wheatgrass, and other bunch grasses.

Sage Foothills - occur on the gentle slopes between the grassland and the timbered areas. These lands are characterized by the dominance of sagebrush.

Douglas-fir - stands occur on the drier aspects in the transition between the sage foothills and the moister lodgepole pine types. Many of these stands represent the encroachment of Douglas-fir into areas which have historically been maintained as grassland communities through natural occurring fire.

Lodgepole pine - types occur on the moister sites in the intermediate elevations. This type comprises the majority of the commercial forest land on the Forest. These stands represent Douglas-fir and subalpine fir climax communities, but have been historically maintained as lodgepole types through a natural cycle of mountain pine beetle infestations and naturally occurring, stand replacing fire.

Subalpine fir/white bark pine - types occur in the upper elevations. These types represent mostly harsh, low productive sites not suitable for timber production.

4. Social and Economic Setting

The Beaverhead National Forest is located primarily in Beaverhead and Madison counties, and Forest activites are most likely to affect people living there. Smaller amounts of the Forest are located in Silver Bow and Deer Lodge counties. People living in these counties also use the Forest and are included in this evaluation.

a. Population

The Forest encompasses portions of five Montana counties. Population in Beaverhead, Madison and Gallatin counties has increased in the period between the 1970 and 1980 censuses, while population in Deerlodge and Silverbow counties has decreased due to the curtailment of the Anaconda Company mine and smelter operations. Census figures for the year 1980 for the five counties by ethnic group is shown in Table III-1

Table III-1 Local Population and Minories

County	White	Native American	Black, Asian and Other
Beaverhead	8,050	97	39
Madison	5,394	30	24
Silverbow	37,106	538	448
Deerlodge	12,170	245	103
Gallatin	42,023	451	391

All five counties have an above-average population of residents over 60 years of age, compared to the remainder of the State.

b. Economy

Per capita income for the four-county area is varied. Madison County is much below the State average of $5,691 at $3,936 while Beaverhead, Deer Lodge and Silver Bow Counties are near or above the State average at $5,372, $5,568, and $5,806, respectively. (All figures are based on 1976 data).

Beaverhead and Madison Counties have a much higher percentage (18.4 percent) of persons employed in agriculture than the State average (10.2 percent). Federal Government employment is lower in all four counties than the state average.

Travel related employment is very important to all four counties. Madison County is forth highest in the state for percentage of employment in the industry at 10.2 percent. Beaverhead and Silver Bow both range around 8 percent.

Employment in manufacturing is lower than the State average of 7.3 percent in Beaverhead, Madison and Silver Bow counties. It is difficult to estimate the percentage of employment in Deer Lodge county due to the closing of the Anaconda operations since the statistics were compiled.

Mining activities provide employment to 4 percent of the population in Madison County, 1.2 percent in Deer Lodge County, and less than one percent in Beaverhead and Silver Bow Counties.

The lumber industry provides approximately 160 jobs in Beaverhead county and 20 jobs in Madison County. This figure varies with the market conditions in the industry.

c. Lifestyles

The local population depends on the Forest for a variety of resources including livestock forage, timber, posts and poles, firewood, recreation (including hunting and fishing), and water for irrigation and domestic use. The Forest generates jobs in the timber, mining and outfitting industries and brings exterior dollars into the community from the tourist trade. For many people, a continued supply of these resources is essential to maintain their current lifestyle.

d. Forest Receipts

Forest receipts come from the sale of timber, grazing permits, mineral leases, special use permits and grazing fees. Twenty-five percent of the gross receipts are returned to State and local governments. Actual forest receipts for years 1981 through 1984 are shown in Table III-2. These figures are expressed in actual figures and have not been adjusted to 1978 dollars.

Table III-2 (Forest Receipts)

Year	Dollars
1981	$ 1,250,653
1982	$ 479,259
1983	$ 737,223
1984	$ 1,247,234
1985	$ 866,720

e. Forest Employment and Budget

The Forest maintains a Supervisor's Office in Dillon, Montana, and Ranger Districts in Dillon, Ennis, Sheridan, Wise River, and Wisdom, Montana. These offices employ persons with a variety of job skills, including professional, technical, and clerical. In addition, the Forest participates in several Federal employment programs including the Older American Program, Youth

Conservation Corps, and the Young Adult Conservation Corps. Employment on the Forest, measured in person work years is as follows for the following years: 1981 = 157.4, 1982 = 152.2, and 1983 = 153.4.

The average annual budget for the Forest in the years 1980 through 1983 has been approximately $3.3 MM (1978 dollars)

B. Current Resource Situation

1. Recreation

Interest is increasing in the recreation opportunities in the Forest and the surrounding area. Attractions such as the Anaconda-Pintler and Lee Metcalf Wilderness areas, excellent hunting and fishing, and the relatively primitive land character are drawing ever-increasing numbers of forest visitors.

The Forest provides a wide range of recreation opportunities for the Forest visitor, including camping, fishing, hiking, backpacking, downhill and cross-country skiing, picnicking, pleasure driving, rock hunting, snowmobiling, and hunting.

Recreation use is measured in Recreation Visitor Days (RVDs), equal to 12 hours of visitor use. The total estimated RVDs for the recreation use of the forest is 495,800/year. This figure is based on 1980 Recreation Information Management (RIM) data.

In recent years, a sharp increase has been noted in the number of visitors coming from distant areas. This increase is partly attributable to the growing populations of nearby cities such as Bozeman and Missoula. The remaining increase is attributable to the attractiveness of Beaverhead County, promotional campaigns to attract visitors, and better highway access to the area.

Since 1970, a significant increase has occurred in the total recreation use on the Forest. Use rates have also climbed sharply on lands in other ownerships. As a result, many private landowners who have traditionally accommodated the recreating public are closing their lands to such use. If this trend continues as expected, recreation use will increase on the public lands due to the displacement from private lands.

a. Dispersed Recreation

The Forest has significant resources to provide dispersed recreation opportunities. The dispersed recreation use based on 1980 RIM data is approximately 304,800 RVDs per year. The potential use, based on current management direction is estimated at 1,780,000 RVDs per year.

Snowmobiling is rapidly growing in pupularity because of the availability of extensive open areas, the dry snow conditions, and the clear winter weather. The Forest provides approximately 15 miles of trail for public use.

The Forest provides excellent opportunities for ski touring in the winter months. Currently the Forest maintains approximately 30 miles of trails for public use. Ski touring is the fastest growing of all winter outdoor sports.

The Forest contains nearly 70 miles of designated National Recreation Trails and over 1,517 miles of maintained system trails. System trails by District are as follows: Dillon District - 252 miles; Wise River District - 291 miles; Wisdom District - 354 miles; Sheridan District - 214 miles; Madison District - 349 miles. These trails provide access to the extensive unroaded portions of the Forest.

The Nee-Me-Poo trail on the Wisdom Ranger District has been proposed as a National Historic Trail. In addition, the route for the proposed Continental Divide Trail traverses the entire western edge of the Forest. Final designation and location of this trail is pending action by Congress.

b. Developed Recreation

The Forest maintains approximately 30 developed campgrounds, 4 picnic grounds and 5 boating sites. These sites are capable of providing 494,000 RVDs per year, and received approximately 179,000 RVDs of use in 1980. In addition, the Forest administers special use permits for 5 privately owned resorts, one organizational site, 12 recreation residence sites, and one winter downhill ski area. Approximately 12,000 RVD's of use occur on these sites.

The ski area is located at Maverick Mountain in the upper Grasshopper drainage. Facilities include a double chair lift, a lodge, and a parking lot. Additional ski developments are located at Deep Creek on BLM land near Wise River, Montana and at Lost Trail Pass on the Bitterroot National Forest west of Wisdom, Montana.

2. Cultural and Historic Resources

The Forest and the adjacent land areas have an interesting history, including old mines, towns, and other historical landmarks.

Over 180 historic and prehistoric sites have been identified on the Forest. These sites date from 6,000 years ago through the 1800s.

Native Americans are known to have traversed through southwestern Montana seasonally. The La Marche Game Trap located on the Forest is listed on the National Register of Historic Places.

White men first saw the area when the Lewis and Clark Expedition passed through the Beaverhead Valley. They crossed the Continental Divide at Lemhi Pass on August 12, 1805. Some of the original group returned through the Big Hole Valley in 1806. Approximately 208 acres at Lemhi Pass are designated as a registered historic landmark by the U.S. Department of Interior.

Montana's first major gold strike occurred near the present site of Bannack in 1862. Shortly thereafter, a large strike was made near Virginia City which, by 1864, had a population of 10,000. Bannack was the first Montana Territorial Capital, but the capital was moved to Virginia City when gold production declined at Bannack. Many old mining camps and ghost towns are located throughout Beaverhead and Madison Counties.

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Cattle ranches were first established during the peak periods of the boom towns of Bannack and Virginia City. Horse Prairie Creek, the Beavehead River, and the Ruby River drainages were well known for the cattle ranches.

In 1877, Chief Joseph and his band of Nez Perce Indians fought several skirmishes with pursuing Federal troops as they retreated from Idaho through the Bitterroot Valley. The National Big Hole Battlefield near Wisdom, Montana, protects the site of one of the major battles.

The first stage roads into Montana connected Bannack and Virginia City with Corinne, Utah. The Utah and Northern Railroad reached Dillon in 1880 and was the first railroad built in Montana.

3. Wilderness, Roadless, and Special Areas.

a. Anaconda-Pintler Wilderness

The Anaconda-Pintler Wilderness is located in the northwestern part of the Forest. The entire Wilderness contains 157,874 acres, of which 72,526 acres are on the Beaverhead National Forest. The remaining acres are on the Bitterroot and Deerlodge National Forests.

The wilderness extends along 30 miles of the Continental Divide and contains a diversity of topography and vegetation. Elevations range from the 5,400 foot willow flats along the Bitterroot River to the 10,793 foot West Goat Peak.

The vegetative spectrum varies with elevation and available moisture. Sagebrush, willow flats, ponderosa pine, Douglas-fir, lodgepole pine and spruce comprise much of the lower elevation vegetative mosaic. These blend into aspen, subalpine fir, whitebark pine, and subalpine larch as the elevation increases. The alpine zone finds bare talus slopes, tarns, and snowfields where lichens, mosses and only the hardiest herbacious plants survive.

The Continental Divide's Anaconda Range is a true Sierra-type mountain range. Evidence of past valley glaciation can be observed throughout the area; it is less prevalent in the Wilderness's southwestern rolling landform area.

The Anaconda-Pintler Wilderness is named for the dominant Anaconda Mountain Range and Charles Ellsworth Pintler, an early day Big Hole settler who first came to the area in 1885.

b. Lee Metcalf Wilderness

The Lee Metcalf Wilderness is located in the eastern portion of the Forest and reaches from the northern end of the Madison Range south over 30 miles to Quake Lake. The Wilderness comprises approximately 259,000 acres located on the Gallatin and Beaverhead National Forests. Approximately 101,000 acres are located on the Beaverhead. This figure has increased since the Revised Draft EIS due to corrections in data resulting from recent land exchanges.

The area was designated wilderness in 1983 with the passage of the Lee Metcalf Wilderness Bill (PL 98-140). The bill included a land exchange with Plum Creek Timber Company to consolidate ownerships. The Forest gave 11,810 acres in the

Jack Creek area in exchange for 24,007 acres in the lower Madison Range, mainly in Cedar, Bear and Indian Creeks.

Elevations on the Beaverhead portion range from approximately 5,000 feet on the lower slopes, to 11,316 feet at Hilgard Peak.

The area exhibits a variety of land and vegetation types similar to those found in the Anaconda-Pintler Wilderness (see above), but geologic features are quite different.

c. Roadless Areas

Approximately 7.6 percent of the Forest is designated as wilderness, another 66 percent is classified as roadless. (USDA, 1979).

The 1977 Roadless Area Inventory conducted on the Beaverhead National Forest identified approximately 1,652,000 acres of land meeting the RARE II roadless criteria. With the approval of the 1978 Beaverhead Forest Final Environmental Impact Statement, all inventoried roadless areas other than all or portions of the North Big Hole (1-001), West Big Hole (1-943), Italian Peak (1-945), West Pioneer (1-006), East Pioneer (1-008), Middle Mountain Tobacco Root (1-013), Potosi (1-014), Garfield Mountain (1-961), Mount Jefferson (1-962), and the Madison (1-549) were dropped from wilderness consideration in RARE II. Before the RARE II study was completed, the West Pioneer and Madison roadless areas were included in the Montana Wilderness Study Act (PL 95-150) and placed in the RARE II further planning category.

On May 2, 1979, President Carter's RARE II recommendations for 661,602 acres of inventoried roadless lands on the Beaverhead Forest were transmitted to Congress. Approximately 150,532 acres were recommended for wilderness, and 287,790 acres for further planning studies; 223,789 acres were "released" to be considered for nonwiderness uses.*

National Forest Management Act regulations (revised September 1982 and amended September 1983) require that each Forest inventory and analyze management opportunities for roadless lands as a part of the planning process. Tables III-3 and III-4 describe the existing inventoried roadless areas, the major resources contained there, and a brief review of wilderness attributes. A complete description of each roadless area is contained in Appendix C.

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*As a result of acreage refinements in the current planning process, the RARE II final recommendation is as follows: Wilderness, 151,413; Further Planning, 281,249; Nonwilderness, 230,914.

Table III-3 Roadless Area Resource Potential

Roadless Areas	Net Area	Tentatively Suitable Timber	Suitable Range	Minerals 1/ Hardrock	Minerals 1/ Oil/Gas	Big Game Winter Range	Fishery Streams
	(acres)	(acres)	(acres)	(acres)	(acres)	(acres)	(miles)
1-001 North Big Hole							
Beaverhead Portion	53,098	42,361	8127	53,098	53,098	7273	69.3
Bitterroot Portion	3691	2470	180	3691	3691	0	1.0
Total:	56,789	44,831	8307	56,789	56,789	7273	70.3
1-003 Beaver Lake	13,474	11,247	543	13,474	13,474	198	24.7
1-004 Saginaw Creek	8493	5143	1171	8493	8493	1602	17.2
1-005 Tash Peak	62,094	41,155	12,058	62,094	62,094	6889	98.0
1-006 West Pioneers	90,532	68,845	20,086	90,532	90,532	23,727	124.9
1-008 East Pioneers	144,543	71,898	20,771	144,543	144,543	53,399	202.7
1-009 Call Mountain	10,179	6204	1518	10,179	10,179	4620	12.2
1-010 Cattle Gulch	18,891	5593	9265	18,891	18,891	26,973	3.2
1-011 Fleecer							
Beaverhead Portion	15,853	9970	4518	15,853	15,853	843	26.7
Deerlodge Portion	21,355	8167	5137	21,355	0	280 2/	12.0
Total:	37,208	18,137	9655	37,208	15,853	1123	38.7
1-012 Granulated Mountain	14,960	10,447	2168	14,960	14,960	2114	23.5
1-013 Middle Mtn. Tobacco Root							
Beaverhead Portion	58,336	18,715	16,269	58,336	0	39,307	70.8
Deerlodge Portion	34,991	7029	25,859	28,580	0	597 2/	53.0
Total:	93,327	25,744	42,128	86,916	0	39,904	123.8
1-014 Potosi	5465	3066	2887	5465	0	4759	4.4
1-015 Bear Creek	8252	4812	2023	8252	8252	205	2.2
1-016 McKenzie Canyon	33,652	8150	23,346	33,652	33,652	15,072	3.7
1-017 Sourdough Mountain	14,838	1964	10,305	14,838	14,838	2545	0
1-018 Timber Butte	5018	905	2238	5018	5018	4291	0
1-019 Dixon Mountain	3982	889	1455	3982	3982	3808	0
1-020 Four Eyes Canyon	8237	842	5849	8237	8237	3611	.8
1-021 Sheep Mountain	32,115	12,459	21,326	32,115	32,115	2682	46.8
1-022 Crockett Lake	6830	1929	4662	6830	6830	4088	6.5
1-023 Cherry Lakes	12,940	4832	9175	12,940	12,940	8750	3.5
1-024 Vigilante	16,458	5747	11,592	16,458	16,458	10,885	14.7
1-025 Snowcrest Mountain	97,630	24,503	56,692	97,630	97,630	21,380	126.4
1-026 Black Butte	39,787	7894	32,506	39,787	39,787	2986	41.2
1-027 Big Horn Mountain	50,390	18,267	17,085	50,390	50,390	22,653	48.3
1-028 Lone Butte	14,138	401	14,138	14,138	14,138	267	12.6
1-029 Freezeout Mountain	95,098	23,629	64,106	95,098	95,098	18,117	102.5
1-427 Storm Lake							
Beaverhead Portion	1808	170	0	1808	1808	0	1.4
Deerlodge Portion	5673	237	0	5673	0	0	0
Total:	7481	407	0	7481	1808	0	1.4
1-942 Anderson Mountain							
Beaverhead Portion	30,331	27,345	1967	30,331	30,331	34	46.5
Salmon Portion	18,120	16,992	0	18,120	0	0	4.8
Total:	48,451	44,337	1967	48,451	30,331	34	51.3
1-943 West Big Hole							
Beaverhead Portion	130,783	76,978	16,945	130,783	130,783	43,208	147.8
Salmon Portion	81,068	22,976	2250	81,068	0	21,120	15.5
Total:	211,851	99,954	19,195	211,851	130,783	64,328	163.3
1-944 Goat Mountain							
Beaverhead Portion	9454	4602	4395	9454	9454	1878	4.1
Salmon Portion	35,468	2810	9994	35,468	0	16,640	2.0
Total:	44,922	7412	14,389	44,922	9454	18,518	6.1
1-945 Maiden Peak							
Beaverhead Portion	90,917	17,325	49,704	90,917	90,917	19,394	61.8
Salmon Portion	50,033	7951	17,851	50,033	0	5120	6.1
Targhee Portion	146,300	3/	124,200	146,300	103,800	42,300 4/	38.0
Total:	287,250	25,276	191,755	287,250	194,717	66,814	105.9
1-961 Garfield Mountain							
Beaverhead Portion	42,701	10,206	39,667	42,701	42,701	0	25.1
Targhee Portion	47,500	3/	38,000	47,500	47,500	8600 4/	38.0
Total:	90,201	10,206	77,667	90,201	90,201	8600	63.1
1-962 Mt. Jefferson							
Beaverhead Portion	4474	590	0	4474	4474	0	4.3
Targhee Portion	60,000	3/	29,200	7000	19,100	56,300 4/	66.0
Total:	64,474	590	29,200	11,474	23,574	56,300	70.3

1/ Includes areas of moderate, high, and very high potential.
2/ Deer and elk habitat acres are included in this total.
3/ Information not available.
4/ Winter and summer range has been combined and includes deer and elk habitat.

Table III-4 Roadless Area Wilderness Suitability

Roadless Area	Wilderness Attributes
1-001 North Big Hole	The natural integrity is impaired by jeep trails accessing the Anaconda-Pintler Wilderness and some active development.
1-003 Beaver Lake	Man's activities, including extensive timber development, have reduced the natural appearance.
1-004 Saginaw Creek	There are minor localized impacts of man including jeep roads, mining, recreation and range development.
1-005 Tash Peak	The natural appearance lacks diversity of terrain and is impacted by the presence of timber cutting, jeep trails
1-006 West Pioneers	Wilderness attributes have been reduced significantly due to range, recreation, timber sales and mining activities. Low standard roads and trails crisscross some of the area.
1-008 East Pioneers	Natural integrity is high with alpine scenery and diversity of vegetation. High ridges and peaks, over 11,000 feet, offer exceptional views. The area has a history of mining and exploration activities. Jeep trails, range development, and mining have reduced the wilderness characteristics in certain areas.
1-009 Call Mountain	The natural integrity is impacted by many low-standard jeep roads, range developments and mining activities. There is only moderate opportunity for solitude and primitive recreation. The area is small and bordered on three sides by developed Forest land.
1-010 Cattle Gulch	Man's influence is apparent throughout. Mining and roading are readily observable in the SE quarter. Jeep roads, fences, water troughs and an abandoned power line exist within the area.
1-011 Fleecer	The area is narrow, 3 miles at its widest point, and surrounded by highly-used recreation and commercial traffic. Logging and wood-gathering roads penetrate the area from all sides. Recent mining activity has shown a high potential for base metals.
1-012 Granulated Mtn.	The area does not have any dominant wilderness features. The many substandard jeep trails and old mining roads crisscrossing the area are used for wood hauling, cattle distribution and recreation.
1-013 Middle Mtn. Tobacco Roots	The natural integrity of this area has been degraded in localized areas. This degradation has occurred from the developmentof jeep trails, mining claims, and some livestock use. Because of the ruggedness of the area and the low human population surrounding the area, natural integrity and appearance remain high.
1-014 Potosi	Logging roads, timber harvesting, mining shafts and old mining road cuts detract from the natural appearance of the area. Several miles of range fences and numerous water developments dot the landscape. A low standard jeep trail runs through the area.
1-015 Bear Creek	The area has little topographic diversity but much vegetative screening. Existing range developments and many low standard roads reduce the natural appearance. The small size limits solitude and primitive recreation.
1-016 McKenzie Canyon	The area lacks diversity and contains little topographic and vegetative screening. Interstate 15 is visible from some of the area. Range developments and low standard roads reduce the natural integrity.
1-017 Sourdough Mtn.	Little topographic and vegetative screening and lack of topographic diversity restrict the opportunity for solitude and primitive recreation.
1-018 Timber Butte	The limited size, lack of diversity, and little topographic and vegetative screening reduce the opportunities for solitude and primitive recreation experiences.
1-019 Dixon Mtn.	The limited size, lack of diversity and topographic and vegetative screening reduce the opportnities for solitude and primitive recreation experiences. Interstate 15 is visible from the area.
1-020 Four Eyes Canyon	High points offer panoramic views of surrounding valleys. The limited size and lack of topographic diversity restrict the opportunity for solitude and primitive recreation.
1-021 Sheep Mountain	Opportunities for solitude and primitive recreation are limited by the size, open grassland viewing and lack of topographic relief. The area can be viewed from Highway 287 and several county roads. The natural integrity is affected by fences, cow camps, water developments for livestock and low quality roads that penetrate the area.
1-022 Crockett Lake	The area's potential for wilderness is impaired by the small size and openness of the landscape which limit opportunities for trails and was intensively managed for livestock including fencing, water development, vegetation spraying and burning Two cow camps are located within the area.
1-023 Cherry Lakes	The rough terrain provides a very scenic, natural appearance. The only exception is the Johnny Ridge area where a large timber sale can be seen. The opportunity for solitude and primitive recreation is considerably reduced by the small size and nearness to man's activities including adjacent roads and a talc mine.

Table III-4 (Continued)

1-024 Vigilante	Human development has influenced the naturalness of the area through grazing, fences, water development and motorized vehicles. The area is part of the original Range Experimentation Station. Several jeep roads are in the area and Forest roads border 3 sides.
1-025 Snowcrest Mtn.	The area is divided into 2 different subareas. The west half has rough, steep terrain with little human impact. The east half has more gentle terrain and therefore is impacted by man with range fencing, water developments and low standard roads. The west half provides opportunties for solitude due to the topographic and vegetative screening and size of the area. Primitive recreation opportunities exist in the west half but are limited in the east half.
1-026 Black Butte	The area is large enough to provide solitude and because of the terrain and vegetation, one can experience a sense of expansiveness. Man's influence relative to livestock grazing has altered the natural integrity of the land, however, the overall appearance has not changed significantly. Roads border the area.
1-027 Big Horn Mtn.	The large area, rugged terrain with peaks over 10,200 feet and limited human influence provide opportunities for primitive recreation and solitude. Cave Mountain, located within this area, is a unique and relatively undisturbed example of an alpine grassland and is being considered for a Natural Area.
1-028 Lone Butte	The area is primarily broken-rolling grasslands dissected by numerous perennial streams. The lack of topography and vegetative diversity limit opportunities for solitude and primitive recreation. Livestock grazing and range management including fencing, spraying, burning and drilling were extensive in the past. There are low standard jeep trails throughout the area.
1-029 Freezeout Mtn.	The overall appearance is quite natural with diverse landscapes of gentle to moderately steep foothills, broad ridgetops, undulating basins, and rocky canyons and ridges. Most of the area shows evidence of man's developments. The ease of accessibility by trails and low standard roads limits solitude and primitive recreation opportunities.
1-427 Storm Lake	The area has a rugged, natural terrain which borders the Anaconda-Pintler Wilderness. Opportunities for solitude and primitive recreation exist. Views of logging on Mt. Haggin are a distraction.
1-942 Anderson Mtn.	Man's influence on the area's natural integrity is minor. Opportunities for solitude, primitive recreation and challenging experiences are provided by the interesting topographic features, including steep, rugged peaks and rocky glacial cirque basins, and dense vegetation of primarily tree cover.
1-943 West Big Hole	The West Big Hole maintains a fair degree of natural integrity. The area contains large timbered areas, natural sagebrush acreage, glacial potholes and alpine settings. Human activities include post and pole cutting, jeep trails, and mining activities.
1-944 Goat Mountain	Goat Mountain possesses relatively low to moderate values for wilderness. Range developments, timber sales and subsequent roads, and many existing low standard roads impact the natural integrity and appearance of the area.
1-945 Madien Peak	The natural integrity and appearance of the area has been impacted by range management activities and jeep trails. Wilderness opportunities are impaired by the narrowness of the area; however, Maiden Peak is surrounded by a sparsely populated and rural community.
1-961 Garfield Mtn.	This area is mountainous with wide expanses of rolling foothills, and offers panoramic views of adjacent valleys. Range developments and low standard roads produce some impacts on the natural appearance and integrity of the area.
1-962 Mt. Jefferson	Despite the small size of the area, the natural integrity and appearance of Mt. Jefferson is rather high except for a small area that has been contour furrowed for erosion control.

d. Research Natural Areas.

The Forest maintains two Research Natural Areas. These area are protected from management activities to serve as ecological reference points or as experimental controls, against which it is possible to measure and assess the results of management activities.

Cliff Lake Natural Area was established in 1952. It is located in the southeast corner of the Forest and comprises 2,301 acres. The area exhibits a diverse set of vegetative communities ranging from Douglas-fir/bluebunch wheatgrass to subalpine fir/grouse whortle berry habitats.

Cottonwood Creek Natural Area was established in 1972. The area is located in the Gravelly range, comprises 128 acres and represents several rangeland vegetative communities including Douglas-fir/bluebunch wheatgrass.

The Forest is currently assessing a number of areas for inclusion into the the Resource Natural Area System. Proposed areas include Cave Mountain, O'Dell Lake, Skull Creek Meadows, Cattle Gulch, Elkhorn Lakes, and Horse Prairie. Candidate areas include Bryant Creek, Steele Creek, Gravelle Creek, Mifflin Creek and Miner Lake.

e. Visual Quality

Much of the Forest maintains a natural or near-natural appearance. The highest category for classifying existing visual condition (EVC), of forest landscapes is "untouched". Eighty percent of the forest meets the criteria of this category.

Only a small percentage of the several hundred thousand remaining acres show significant signs of modification, and much of this is in timber sale areas that have been cut within the last two decades. Earth moving activities, road building, mining and mineral exploration have longer lasting impacts than timber harvest, but individual projects usually directly impact smaller areas.

Prior to 1950, the majority of timber harvest on the Forest was for firewood, mine stulls, railroad ties, house logs, and post and poles, rather than for sawtimber. During the early and mid-70's very little timber was harvested on the Forest. Many of the sale areas that were sold in the 1960's and earlier are at least partially recovered visually. Some individual sales prior to the late

1970's produced large cutting units that do not match the nearby vegetative patterns. Under current standards, these units would be visually unacceptable. Other large cutting units are visually acceptable in that they relate in size, shape, and scale to existing openings and existing vegetative patterns.

Visual quality objectives are measured by the character of the landscape and diversity of features and vegetative patterns (USDA Forest Service, 1977). Four visual quality objectives and their characteristics are displayed in Table III-5. A fifth category, preservation, is reserved for classified wilderness, scenic areas and research natural areas where changes would be natural and not induced by management.

Table III-5

Visual Quality Objective	Scenic Quality	Management Activities will be -	Viewed from Major travel/Residential areas?
Retention	Low-very high	Not visually evident	Yes, in foreground
Partial retention	High-very high	Visually subordinate	Yes, in middleground
Modification	Moderate	May visually dominate	Maybe in background
Maximum modification	Low-moderate	Visually dominant	No

4. Wildlife

The Forest provides habitat for approximately 385 wildlife species including elk, moose, mountain goat, bighorn sheep, whitetail deer, mule deer, mountain lion, black bear, birds, small mammals, and fur bearers.

Portions of the Forest in the Madison and Gravelly Ranges are included in the Greater Yellowstone Area. This area includes portions of a number of National Forests, Yellowstone National Park, Bureau of Land Management and U.S Fish and Wildlife Service lands. The Beaverhead coordinates with these agencies in the management of the area.

a. Threatened and Endangered Species.

Two animal and two bird species currently or historically found on the Forest are listed Federally as threatened or endangered under the Endangered Species Act of 1973.

The endangered bald eagle nests in the southeast portion of the Gravelly Range and winters along the Red Rock, Ruby, Jefferson, Madison, Big Hole, and Beaverhead Rivers. There are currently three known active eagle nests on the Forest. Most migration and wintering activity occurs off Forest adjacent to the large river valleys. A portion of the Ruby River Valley has been delineated as "essential" habitat for the bald eagle. The Forest is an active participant in the Greater Yellowstone Bald Eagle Management Plan.

The endangered peregrine falcon historically inhabited the Forest. At the present time there is no known occupied peregrine falcon habitat in the Forest. "Essential" unoccupied peregrine falcon habitat has been delineated in the southeast portion of the Gravelly Range. Currently the peregrine is being reintroduced into the Centennial Valley, off Forest, south of the Gravelly

Range. Reintroduction of the peregrine on Forest is a possibility, either through natural movement or by artificial methods. While habitat surveys have not been conducted, preliminary analysis indicates that the southern end of the Madison Range may also have potential for peregrine reintroduction.

The endangered gray wolf is an occasional visitor to portions of the Continental Divide southwest of Dillon. The sporadic wolf activity on the Forest is believed to consist of individual or pairs of wolves. No evidence of pack activity has been observed. The wolf populations are believed to be low, with the individual wolves utilizing a large geographic area, including portions of the Salmon National Forest. The Forest is an active participant in the Continental Divide Gray Wolf Coordination Plan.

The threatened grizzly bear is suspected of utilizing portions of the Madison Range within the Lee Metcalf Wilderness and is an occasional visitor to the Tobacco Root Mountains and the Gravelly Range. The Beaverhead National Forest does not include "occupied habitat" identified in the Greater Yellowstone Grizzly Bear Recovery Plan.

It is the biological opinion of the of the U.S. Fish and Wildlife Service that the Proposed Action will have beneficial effects on the bald eagle and no effect on the endangered gray wolf, peregrine falcon or threatened grizzly bear.

b. Big Game

The Montana Department of Fish, Wildlife, and Parks, estimates the current summer elk population on the Forest at approximately 12,200 head. Due to the great diversity of habitats on the Forest, summer range is not considered a limiting factor.

The Forest contributes approximately one-third of the total elk winter range utilized during a normal winter. The remainder is located on the Salmon, Bitterroot and Deerlodge National Forests, Bureau of Land Management, States of Idaho and Montana, and privately owned lands.

The Montana Department of Fish, Wildlife and Parks was contacted regarding an estimate of the reasonable number of elk that could be tolerated on the winter ranges. It is known that in severe winters, many elk are forced down onto private lands because of deep snow on the Forest, causing conflicts with the private land owners.

The Department estimated the overall maximum tolerable number of wintering elk at approximately 11,650 head, including 7,500 on non-Forest winter range. Thus, approximately 4,150 elk is all the Forest portion of the winter range should attempt to carry to avoid a potentially serious range conflict with non-Forest ownerships. The difference between the summer population and the winter population occurs because the number of elk that migrate from the Beaverhead to the Salmon and Bitterroot National Forests exceeds the number that migrate from the Gallatin and Targhee, to the Beaverhead National Forest in the winter.

Currently, the Forest limits domestic livestock use on wildlife winter range to no more than 35 percent of the available forage. This limitation assures that adequate forage is retained to support the reasonable number (4,150) of elk on the Forest portion of the winter range.

Mule deer are an abundant species on the Forest. Most deer spend the winter primarily off the Forest. Deer populations are currently high and habitat conditions are considered good. The Montana Department of Fish, Wildlife and Parks has estimated current summer populations to be approximately 20,000 head. The Forest portion of the winter range supports approximately 5,400 deer while overall winter populations are approximately 15,000.

The Forest also provides habitat for an estimated 700 moose, 1,500 pronghorn antelope, 650 black bear, 485 mountain goats, 400 white tailed deer, 85 bighorn sheep, and 50 mountain lions.

c. Fur Bearers

The Forest provides habitat for a variety of fur bearing species including beaver, mink, otter, muskrat, pine martin, bobcat, lynx, fox, hare, rabbit, fisher, and wolverine.

d. Nongame

The Forest currently provides habitat for a wide variety of nongame species, including mammals, reptiles and birds. The relative abundance of older age class habitats present on the Forest both in the forested and grassland communities tends to favor species dependant upon those types. Lesser amounts of habitat are available to those species dependent upon younger seral vegetative communities.

e. Birds

The Forest has a relatively high abundance of birds of prey. Species such as prairie falcon, golden eagle, redtailed hawk, ferruginous hawk, Swainsons hawk and American kestrel, are associated with open habitats. The goshawk, Coopers hawk, and sharp-shinned hawk are primarily associated with forested areas. Owls, such as the great grey and boreal are associated with the lodgepole habitat types. Ospreys utilize forest land adjacent to lakes, especially in the southeast Gravelly Range.

Game bird species include blue, ruffed and spruce grouse, hungarian partridge, and several species of ducks and geese. A large number of nongame bird species are also found. Large cavity nesters such as the pileated woodpecker are limited due to the small diameter of the snags associated with a lodgepole forest type.

The trumpeter swan is known to nest in the southeastern section of the Gravelly Range on Elk Lake and some surrounding small lakes adjacent to the Red Rocks National Wildlife Refuge. The trumpeter is a species of concern in that populations are limited and reproduction success is poor. Overall trumpeter distribution on the Forest is unknown and further survey work is necessary.

f. Indicator Species

The Forest has established a list of wildlife management indicator species. These species are selected to monitor the overall condition and availability of various wildlife habitats occuring on the Forest.

The Forest utilized the following format in considering which wildlife species should be selected for indicator species.

1. Endangered and threatened wildlife species. These include the peregrine falcon, bald eagle, gray wolf, and the grizzly bear.

2. Species commonly hunted, fished, or trapped were considered. These species include elk, mule deer, pronghorn antelope, moose, bighorn sheep, mountain goat, black bear, mountain lion, sage grouse, and blue grouse.

3. Species that have special habitat needs that might be influenced significantly by planned management programs, and/or whose population changes are believed to indicate effects on other species or a major biological community.

The final selected wildlife indicator species are listed below:

Grizzly Bear	Threatened Species
Peregrine Falcon	Endangered Species
Bald Eagle	Endangered Species
Gray Wolf	Endangered Species
Elk	Big Game Species
Sage Grouse	Sagebrush Communities
Pine Martin	Old Growth Spruce/Fir
Goshawk	Old Growth Douglas-fir
Trumpeter Swan	Marshland Communities
Arctic Grayling	Cold Water Fisheries
Cutthroat Trout	Cold Water Fisheries

g. Diversity

Habitat diversity is a key factor in maintaining good habitat conditions for wildlife (USDA, 1978, 1979). Diversity is measured by the relative proportions of vegetation types and successional stages within those types occurring on the Forest.

The Forest currently maintains an abundance of grass-forb, mature and old growth vegetation types. Management of the Forest through timber harvest provides the majority of early successional stages important to many wildlife species. Existing condition classes are shown in Table III-6.

Table III-6.

Existing Condition Class Acres (Thousands of Acres)

Grass Forb	Shrub-Seed	Pole-Sapling	Young	Mature	Old Growth	Total
1,004.8	149.6	40.4	141.9	566.4	244.0	2,147.1

h. Riparian

Riparian areas are important for providing the greatest vegetative mix and resulting wildlife diversity (USDA, 1979). The riparian areas on the Forest are generally in good condition; however, livestock grazing has reduced the quality in some areas.

5. Fisheries

Game fish species occurring on the Forest include cutthroat, rainbow, brown, golden, brook and rainbow-cutthroat hybrid trout, as well as arctic grayling, and mountain whitefish. There are no anadromous or threatened and endangered fish species occuring on the Forest; however, the State of Montana classifies the cutthroat and arctic grayling as "Species of Special Concern".

There are approximately 1,050 miles of fishable streams, and 155 lakes on the Forest providing 4,184 acres of habitat for a potential of 426,000 catchable trout occurring in lakes, and 324,000 in streams

Water quality and fish habitat are generally considered in excellent condition; however, some streams in grazing allotments have been degraded due to the loss of cover and trampling of the stream bank (Platts, 1971). These conditions are expected to improve as allotments are managed through allotment management plans and structural improvements are installed to redistribute use.

The Madison, Beaverhead, and Big Hole Rivers are classified as "Blue Ribbon" fishing streams of national significance. Many of the small tributaries on the Forest provide spawning and rearing habitat to these and other downstream fisheries and influence both the quality and quantity of water flowing into them. It is estimated that the Forest has the potential of contributing 157,350 adult fish to the downstream fisheries.

Fishing use within the Forest under existing conditions is 45,454 RVDs per year. This use is considered significant to the economy of the area.

The Forest has recently added arctic grayling and cutthroat trout to the list of species which will be monitored to measure the impact of management activities on other forest resources.

6. Range

The current domestic livestock grazing level on the Forest is 190,000 Animal Unit Months (AUM's) per year. Approximately 2 percent of this total occurs as recreational use of transportation livestock. The majority of commercial use occurs on 578,786 acres of suitable range including 12,000 acres of transitory range grazed in the Big Hole Area. The average stocking level on the Forest is 3.02 acres per AUM. Including acreage in rest pastures, the actual stocking rate of the grazed areas is about 2.5 acres per AUM.

Currently, 216 permittees utilize 173 active grazing allotments on Forest lands. Cattle grazing permits vary in size from 7 to 1,477 head, with an average of approximately 178 head per permit. Sheep permits range from 1,350 to 4,000 head.

Currently, approximately 11,055 acres of suitable range are closed to domestic livestock grazing. Many of these areas are closed due to their importance for use by big game during the winter. Several others are currently being reevaluated and may be reopened for use by domestic livestock under specified conditions.

Approximately 75 percent of the grazing allotments are currently operating under an Allotment Management Plan (AMP). Under this current management 84 percent of the suitable range is in good to excellent condition. Currently, 32 percent of the suitable range is maintaining forage production in an upward trend, 51 percent is stable and 17 percent is declining. Proposed management would be designed to improve the condition and trend of rangeland in less than good condition and maintain or improve the condition and trend of remaining areas.

7. Timber

Forty percent of the Forest is classified as suitable timber land. The majority of the commercial stands of timber are composed of lodgepole pine; however, lesser amounts of commercial Douglas-fir stands are found in the transition between the grasslands and the lodgepole pine. Stands of Engelmann spruce are found on many of the wetter sites. Subalpine fir, whitebark pine, limber pine, and alpine larch are found in the higher elevations, but are not generally considered commercial due to low value, harsh environmental conditions, and low productivity.

Productivity on the forest is considered low to moderate, ranging between 20 and 80 cubic feet per acre per year, with an estimated mean of approximately 35 cubic feet per acre per year (Pfister, 1977).

A large proportion of the Forest's existing timber stands exceed 100 years of age, and have a high incidence of insect and disease, including dwarf mistletoe in the lodgepole pine and spruce budworm in the Douglas-fir. A mountain pine beetle epidemic is currently centered in the Madison Valley, and is expected to spread to the remainder of the Forest in the next decade. The potential for high mortality in the lodgepole stands is great.

Total standing volume on the Forest is estimated at 5.8 billion board feet. Of the total number of trees on the Forest, 66 percent is lodgepole pine, 17 percent is Douglas-fir, and 6 percent is Engelmann spruce. The remainder is in smaller amounts of subalpine fir, whitebark pine, alpine larch, ponderosa pine and Aspen.

Diameter of the lodgepole pine ranges up to 18 inches; however, the average diameter harvested from mature stands is 9 inches. Diameters of the Douglas-fir and Engelman spruce are larger, ranging up to 36 inches with an average sale diameter of 12 inches

Regulated timber offered for sale on the Forest has averaged 26 to 30 million board feet of timber per year since 1978. This figure exceeds the allowable sale quantity allowed in the 1978 Beaverhead Land Management Plan due to backlog volume accrued during the suspension of timber harvest during the past planning process. The volume of regulated timber offered and actually sold since 1978 is shown in the following Table III-7.

Table III-7 (Timber Sale Volume)

YEAR	MMBF OFFERED	SOLD LOCAL	SOLD OUT OF STATE	SOLD TOTAL
1978	26.6	26.6	0	26.6
1979	35.0	20.2	0	20.2
1980	23.8	11.6	8.1	19.7
1981	29.4	14.5	14.6	29.1
1982	26.3	20.1	0	20.1
1983	30.2	28.0	0	28.0

Beaverhead National Forest timber has historically supplied timber to the mills in the Darby, Belgrade/Livingston, and Dillon areas of Montana and to the mill in St. Anthony Idaho. The Mt. Haggin area is under long term contract with the mill in Deerlodge, Montana.

Production at the mill in Dillon has required about 16 MMBF (log scale) per year with about 60 percent of that supplied by the Beaverhead National Forest. (See Planning Records: Memo to Files dated 1/86, Giannettino.) Located near the center of the Forest, the Dillon mill has drawn logs from all sections of the Forest, while competitors have purchased logs around the edges. Mills in Belgrade and Livingston have purchased sales from the east side of the Forest, mostly salvage sales associated with a mountain pine beetle epidemic. The mills in Darby occassionally purchase sales on the west edge of the Forest. Mills in Deerlodge and St. Anthony occassionally buy sales on the north and south edges of the Forest respectively.

About seventy-seven percent of the Forest's timber sale program is reserved for small businesses, which includes the mills in Dillon, Darby, Livingston, and St. Anthony.

Data from 1981 indicates the capacity of mills in the Darby, Dillon, and St. Anthony areas is approximately 70 MMBF and the volume processed averages about 45 MMBF. Like most mills in Montana and Idaho, available data indicates these mills are operating below their maximum processing capacity. About 88 percent of the volume processed by these mills is National Forest timber (see Forest Planning Records--"Region I Timber Supply Impacts on Local Mill Groupings"). About 1 MMBF of timber was used by the mills in Ravalli County (the Darby area) in 1981 (Forest Planning Records, Bitterroot NF Planning Note #187). The historic supply of timber from the Beaverhead to the Bitterroot has been relatively small compared to the supply of Beaverhead timber to St. Anthony and Dillon mills.

The majority of vegetation treatment that takes place on the Forest is accomplished through the timber harvest program. Past experience has demonstrated that the timber program is an effective method of managing the forested area of the Forest to meet other resource objectives such as providing forage for livestock and wildlife, providing diverse habitat for a variety of game and nongame wildlife species, roaded recreation, access for fire protection and access to unroaded areas of the Forest.

Due mostly to the high cost of roading initial entry timber sales, the Forest generally receives less return on the timber program than the actual direct development costs at this time. The cost of second and subsequent entry timber sales will be less as much of the necessary road system will be in place. Subsequent entry sales may return more receipts than development costs and the long term management of timber across the Forest is considered to be cost efficient.

Timber receipts and costs for years 1983 through 1985 are indicative of recent years and illustrates the relationship between the cost and receipts of current timber management. Costs and receipts for any given year are not directly related as receipts for a timber sale may be realized several years following sale preparation costs. Costs shown in the following table are collated and extracted from annual Forest cost and accounting data.

Table III-8

Costs	1983	1984	1985
Total Sale Preparation	$254,200	$277,900	$252,500
Road Construction Capital Investment	1,708,500	788,400	1,400,900
Road Construction Contributed	1,516,400	71,600	400,300
Road Construction Purchaser Credit	$161,700	216,800	139,200
Total	$3,640,800	$1,354,700	$2,192,900
Receipts			
Timber Sale Receipts	$271,953	$627,330	$478,366
Purchaser Credit Collected	$242,853	$377,684	$160,127
Total	514,806	1,005 014	$638,493

Purchaser Credits are those funds credited to timber sale purchasers for road construction completed by the purchaser. These credits are applied against the cost of stumpage.

Capital Investment Funds are paid directly to Road Construction Contractors for the construction of timber roads. These funds are generally used to construct arterial or collector roads into initial entry timber sale areas. These roads are high standard roads designed to access the area for long term multiple resource managment and generally remain open for public use. Capital investment funds are also avialable for construction of roads developed for recreation access and other uses; however those expenditures are not included in these figures.

Contributed Funds are paid directly to timber sale purchasers for the construction of roads on the sale area. These funds are generally used to construct local roads for the sale area. These roads are generally closed to the public but will be used to complete cultural treatments, to access the forest for fire protection, and will be used to access subsequent timber entries.

As shown in the table, costs are greater than receipts; however, roads constructed for sales generating these receipts will be used to access sales in the surrounding area, and to access future timber entries. The benefits of vegetative management as described above are also direct benefits of these expenditures.

8. Watershed and Soils

General watershed conditions are good, and water quality is high on the Forest. Sedimentation is the major water quality variable affected by Forest management and use.

The Forest exhibits a wide array of parent materials and associated soils each having a unique set of management implications. Parent materials include granitic, volcanic, metamorphic, sedimentary, and belt series formations. Soils range from very shallow, low productivity, to deep alluvium with high productivity.

Erodibility and potential to deliver sediment to stream channels varies widely from one soil type to another. Some exhibit high natural erosiveness while others contain a high percentage of blocky fragments with insignificant erodibility.

Disturbance associated with road construction, timber harvest and site preparation causes widespread soil impacts on the Forest. The degree and duration of these impacts depend on the type and condition of soils and landscapes, the intensity of the management activity, the mitigation measures applied and the unpredictable events of high intensity storms or wildfire. Best Management Practices (BMPs) are employed when potential impacts are identified.

The Forest annually provides approximately 2.5 million acre-feet of water to the Missouri River drainage.

Three municipal watersheds on the Forest provide water to local communities as shown in Table III-9.

Table III-9 (Municipal Watersheds)

Source	Municipality	Gallons/day
Big hole River	Butte, Mt	13,000,000
Rattlesnake Cr.	Dillon, Mt	648,000
Indian Creek	Sheridan, Mt.	81,000

The Forest Service maintains developed water wells and springs sites to furnish potable water to 30 campgrounds and 17 administrative sites. There are 37 impoundments developed for irrigation or recreational use. A number of livestock watering facilities also exist. Total water use from the Forest is currently 1,403,820 acre feet. Developed sites and structures are shown in Table III-10

Table III-10 (Existing Water Developments)

Source	Number	Use	Location
Wells	32	Potable Water	Campgrounds & Administrative Sites
Springs	15	Potable Water	Campgrounds & Administrative Sites
Impoundments	34	Irrigation	Various
Impoundments	3	Recreation	Various
Springs	423	Livestock	Range sites
Well and Pump	1	Livestock	Range sites
Pipeline	87.4 mi.	Livestock	Range sites
Water Troughs	105	Livestock	Range sites
Trick Tank	1	Livestock	Range sites
Pit Tank	2	Livestock	Range sites
Reservoirs	79	Livestock	Range sites
Open Ditch	2.57 mi.	Livestock	Range sites

9. Minerals

The Beaverhead National Forest contains significant mineral and energy resources. The location, identification, development, and production of these resources are expected to play an important role in the future of the area.

In general, the Forest is highly mineralized. Mining in the area began about 1862 and was characterized by small to medium sized operations producing intermittently. In recent years, many of these older mines have reopened.

A wide variety of geologic environments, highly favorable for the occurrence of many mineral commodities, occur on the Forest. The following is a list of some significant mineral potentials and occurrences:

Talc - occurs in the Gravelly and Madison Ranges, and Tobacco Root, Greenhorn and Henry's Lake Mountains. Production has occurred from National Forest land at the Willow Creek mine in the Greenhorn Mountains. Talc deposits, that currently are being mined off the Forest in the Johnny Gulch drainage of the Gravelly Range, extend onto nearby National Forest land. Exploration drilling currently is further defining available talc reserves in some of the above areas.

Molybdenum and tungsten - occur in the Pioneer Mountains in large, low grade deposits. Past production of tungsten has occurred at several locations, including Calvert Hill, Brownes Lake, and Garret Hill (Dyce Creek). Exploration drilling currently is taking place to further define the available reserves at UMETCO's tungsten property near Sugarloaf Mt. and Agnes Lake, in the eastern Pioneer Mountains. Exploration drilling for tungsten has taken place recently in the vicinity of Mitchell Park near Mt. Fleecer. Exploration drilling for molybdenum has occurred and may continue in the future at as many as ten different properties throughout the Pioneer Mountains; other prospects, identified through geochemical exploration but undrilled as yet, also exist. Cyprus (AMOCO Minerals) is continuing exploration drilling at two molybdenum properties in the eastern Pioneer Mountains, Cannivan Gulch and Black Lion Mt. At the Cannivan Gulch deposit, bulk samples for metallurgical testing have been obtained from an adit driven by Cyprus, and a mineral survey (part of a mineral patent application) has been completed.

Thorium - occurs in veins near Lemhi Pass. Exploration drilling also is occurring in this area to further define existing deposits. These deposits are among the largest in the world of this type.

Iron - deposits occur in the Tobacco Root Mountains near Copper Mountain and in the Gravelly Range near Standard Creek. Most of these deposits have been patented, resulting in only minor recent exploration on additional Forest administered lands.

Gold, silver, copper, lead and zinc - have significant potential for production on a large portion of the Forest. There has been considerable production of these commodities in the past, and a number of underground mines in the Pioneer and Tobacco Root Mountains, and the West Big Hole area are being actively developed. Some of these are listed below. S & S Diversified, Inc. is developing a base and precious metals underground mine near Wisdom, in the Slag-a-melt drainage. They are expected to continue underground development, and onsite concentration of ore produced. Plans for the construction of a flotation mill currently are being developed. Ajax Gold Inc. is expected to continue development of the Ajax mine on private land near Ajax Lake southwest of Wisdom. Underground exploration and development for base and precious metals that began in 1983 in the Clark's Canyon and Long John drainages of the Pioneer Mountains are expected to continue. Operators are local, small miners. Meridian Minerals Inc. is conducting exploration drilling for base and precious metals in the French Creek mine area in the southern Pioneer Mountains. Pegasus plans to conduct exploration drilling for precious metals in the upper Jerry

Creek drainage north of Wise River. In addition, there are a number of active placer gold mining operations in the Tobacco Roots, Big Hole, and Pioneers.

Silica - occurs in a high purity deposit in the Little Sheep drainage near Lima. NICOR, Inc. completed exploration drilling of this deposit in 1983.

Decorative stone - is mined in several locations in the Gravelly Range and Henry°s Lake Mountains with small scale operations.

Gypsum - occurs in the Gravelly Range, and exploration is taking place.

Phosphate - bearing strata occur throughout a large part of the Forest, in the Gravelly, Snowcrest, and Madison Ranges, in the Pioneer Mountains, and in the Mt. Fleecer area. There are several active leases on the Forest that have experienced some limited development in the past.

Many other valuable mineral commodities including limestone, travertine, rare earth minerals, uranium, asbestos, fluorite, graphite and barite occur on the Forest.

Oil and gas - significant potential exists across a large portion of the Forest in overthrust and foreland structures, and within deep Tertiary basins. Portions of the Gravelly and Snowcrest Ranges, the Tendoy Mountains, and the Lima Peaks areas have very high geologic favorability for oil and gas.

Interest in oil and gas resources has been escalating rapidly. Prior to 1975 there were few oil and gas leases on the Forest. Between 1975 and August, 1979, 330 lease applications covering 633,930 acres were received. Since then the number of leases or applications has risen to 874 covering over 1.6 million acres (as of 4/1/84). Over 603 leases have now been issued with stipulations for environmental protection. Some lease applications have now been received for every part of the Forest. All leasing for oil and gas resources on the Forest is accomplished in accordance with proceedures outlined in the Environmental Assessment for Beaverhead National Forest Oil and Gas Leasing which is an appendix of the Forest Plan.

Interest in geophysical (including seismic) exploration also is increasing rapidly. Seismic lines have totaled 100 miles or more in each of the last three years (1981-1983), and have involved many different oil companies. Geophysical (seismic) prospecting activity probably will be concentrated in the Tendoys to Lima Peaks areas, near Lima and Dell, and also in the Gravelly and Snowcrest Ranges, southeast of Ruby Reservoir. An oil and gas drillsite was approved in the Tendoy Mountains in 1985. Construction of the drill pad and access road are completed and drilling commenced in late in 1986. Preliminary inquiries concerning drilling in the Gravelly and Snowcrest Ranges have been received recently, but drillsite applications have not been submitted. Interest in seismic exploration and drilling is expected to continue and increase in the next few years, as issued leases approach the end of their terms.

Geothermal - warm and hot springs (potential geothermal energy resources) occur in several locations on the Forest. Favorable conditions include the presence of geologically recent volcanic and intrusive rocks, travertine, and geyserite deposits. Several lease applications were received for locations in the Gravelly Range, but these were later withdrawn.

Coal and oil shale - are found in low grade occurrences in several areas on or near the Forest, although development of these resources is not feasible at the present time. There is one active coal lease.

Although the inplace values of mineral and energy resources are difficult to estimate, some attempts have been made.

Locatable minerals - The reserve base of the Beaverhead National Forest is estimated to be valued at 6.1 billion dollars. The reserve base is composed of medium to large deposits of molybdenum, tungsten, iron ore, metallurgical grade silica, and talc, and small deposits of gold, silver, copper, lead, and zinc. In order for the in-place value of a deposit to be included within the reserve base, that deposit must have identified grade, quality, thickness, and depth. It must be capable of being mined economically at the present time, or have reasonable potential for becoming economically available within a 50-year planning horizon.

10. Human and community development

Human and community development activities include programs that assist people and communities while enhancing Forest management. Proposed land uses and scheduling of outputs in any of the alternatives will not directly affect these programs, or budgets.

In 1983, the Forest accomplished 3.33 person years of volunteer work, 1.25 person years under the Senior Community Service Program, and .4 person years under other various Federally funded programs.

In past years, the Forest has participated in the Young Adult Conservation Corps and the Youth Conservation Corps. These programs emphasized conservation work and environmental awareness.

11. Lands Program

a. Special Uses

The Forest administers 304 special use permits authorizing the use of 4,929 acres for such uses as ditches, dams, water sources, recreational occupancy, utilities, communication devices and approximately 222 miles of right-of-way.

The Forest currently maintains 34 special use permits for recreational residences. Several of these permits are planned for termination within the next twenty years. Six permits are currently issued for public resorts including a cabin-trailer park at the mouth of the West Fork of the Madison River, a marina on the Horn Creek Fork of Cliff Lake, two resorts at Wade and Elk Lake which provide cabin accommodations and boat rentals, a resort with lodge and cabin accommodations at Elkhorn Hot Springs, and a high country resort at Canyon Creek that provides cabin rentals, horse rentals, guided pack trips and outfitter-guide services. In addition, the Forest maintains a special use permit for the Maverick Mt. Ski Area.

In 1984, the Forest contracted a concessionaire to operate the Cliff Point, Wade Lake, West Fork, Hilltop, and Madison Campgrounds.

b. Property Boundary Location

Most exterior boundaries of the Forest were surveyed between 1900 and 1930. The original surveys generally used brass caps and the lines can be easily located. Interior land line location generally occurs in conjunction with timber harvest and road construction projects. Past land line location has resulted in the remonumentation of 182 section corners, and 95 miles of Forest boundary line surveyed and marked to standard. The Forest plans to post and mark approximately 23 miles of boundary lines annually, with additional corner search and remonumentation.

c. Right-of-way Acquisition

The Forest is currently working to secure several road and trail rights-of-way to provide legal access to the Forest for resource development, as well as to provide public access.

d. Land Ownership Adjustment

The Forest is currently working to consummate several land exchanges that involve 330 acres of Federal lands and 267 acres of non-Federal lands. These exchanges are desired to resolve conflicts, or to provide for more efficient management of Forest lands. A large exchange with Plum Creek Timber Company was recently consummated through the Lee Metcalf Wilderness and Management Act of October 31, 1983, (PL98-140). This exchange involved the consolidation of Plum Creek Timber Company lands in the Jack Creek Drainage of the Madison Range, and Forest lands in the Lee Metcalf Wilderness. Plum Creek Timber Company received 11,810 acres in exchange for 24,007 acres received by the Beaverhead and Gallatin National Forests. The portion received by the Beaverhead contained 19,408 acres.

12. Facilities

The Forest road system comprises approximately 1,685 miles of existing road, including 585 miles of arterial and collector roads, and 1,100 miles of local roads. Of the total, approximately 950 miles are maintained and 735 remain in primitive condition. In addition, at least 2,500 miles of unmapped nonsystem "wheel tracks", and "jeep roads" exist.

Due to the gentle topography of much of the Forest, off-road vehicle use is common. This type of travel has become excessive in some areas, causing damage to the vegetation and soil erosion.

In many locations, public access is not available to Forest lands. The Forest plans to acquire access where it is deemed necessary to complete management activities or to provide recreation access.

The Forest contains approximately 1,587 miles of maintained trails. These trails are used for horseback riding, trail bike riding, back packing, and the movement of livestock. Many trails have restrictions limiting the type of use allowed.

The proposed Continental Divide Trail, if approved and funded by Congress, would follow along nearly 130 miles of the western edge of the Forest.

The Forest, in cooperation with other governmental agencies, maintains an interagency travel plan. The plan provides for the closure or use restriction of many roads and trails on the Forest on a seasonal or yearlong basis. Closures and restrictions are designed for protection of the road bed, to avoid user conflicts, to prevent erosion, or to provide security for big game animals.

The Forest maintains a number of cabins and small administrative sites including barns and corrals. These sites are used as work centers during the summer months. Several cabins on the Forest are available for public recreational rental when not needed for Forest administrative use.

13. Protection

Wildfires and insect epidemics have played a major role in the development and present conditions on the Forest. These forces will continue to play an influential role in the dynamics of the Forest ecosystems.

a. Fire

Fire is an important and natural force in the development of healthy ecosystems on the Forest. Lodgepole pine ecosystems are dependant upon fire to regenerate stagnant, decadant and disease infected stands. Douglas-fir ecosystems are dependant upon fire to maintain encroachment areas in grassland vegetative communities and to provide browse in the understory.

A great number of acres on the Forest burned in the years 1879 and 1889. These fires generated the extensive stands of 80 to 95-year old stands of lodgepole pine existing presently. Protection of the Forest from fire since the early 1900s has allowed Douglas-fir encroachment into grasslands, and allowed lodgepole pine stands to age to a condition of decadence. This has resulted in a reduction of forage available to domestic livestock and wildlife, and has increased the risk of large catastrophic fires.

Fire data compiled for the years 1940 through 1980 indicate a total of 982 fires occurring on the forest. Of this number, 71 percent were lightning caused while 29 percent were man caused.

During the 1930s, a mountain pine beetle epidemic killed many of the larger diameter lodgepole pine over extensive areas of the Big Hole area. Many of these dead trees have now fallen and create heavy fuel concentrations that present an extreme risk of intense wild fire during dry weather conditions.

In 1979, a Fire Management Plan was prepared and implemented for the Anaconda-Pintler Wilderness. This plan allows for fire to play a more natural role in the wilderness ecosystem. Naturally occurring fires will be allowed to burn uncontrolled when such activity will not adversely affect areas outside the wilderness and lives are not threatened.

In 1979, the Forest entered an interagency agreement with the Bureau of Land Management, to provide a coordinated and economical aerial detection, fire dispatch, and initial attack system for Federal lands in southwestern Montana.

Under present policy, the Forest takes immediate fire suppression action in all cases of unplanned ignition outside wilderness. Within wilderness, fire suppression action is taken on all man-caused fires and fires not within prescribed limits.

Prescribed burning is used on the Forest to accomplish several management objectives: reduction of activity fuels, preparation of harvested areas for planting, preparation of harvested areas for natural regeneration, stimulation of browse species for wildlife, and improvement of range forage for livestock.

b. Insect and Disease Conditions

Significant insect and diseases occurring on the Forest include mountain pine beetle, western spruce budworm, dwarf mistletoe, and several species of root rot (USDA, 1983)

Mountain Pine Beetle is the most serious insect problem on the Forest. The insect attacks stands of lodgepole pine as they become mature. Stands greater than 80 years old with average diameters over seven inches are most susceptible. Epidemics have occurred historically across the Forest in nearly all lodgepole pine types. A major infestation occurred in the Madison area in the late 1970s and continues to a lesser degree. Much of the remainder of the Forest contains conditions favorable to the beetle, and further outbreaks may occur in the near future. The probability of major mortality is great in many areas.

Control is affected through the use of timber harvest. Susceptible stands are harvested before mortality occurs when possible. Prevention of future epidemics is planned by developing a diversity of size and age classes, maintenence of tree vigor through cultural treatments such as thinning and the harvest of stands prior to high susceptibility.

Western Spruce Budworm - has attacked many of the Douglar-fir stands on the Forest. The insect has caused mortality of some smaller trees; however, the major impacts are top kill and loss of new needle growth resulting in up to 50 percent reduction of growth in the infested trees (Fauss, 1969). Control is possible with the use of aerial spraying of insecticide but is not considered economical. Biologic control is affected through maintence of single storied fast growing stands.

Dwarf Mistletoe - is common in the lodgepole pine stands on the Forest. The parasite causes deformity in the infected trees and growth loss. Control is affected by clearcutting infected stands and removing infected trees during thinning operations.

Root Rots - occur in virtually all areas of the forest. Scattered mortality occurs but is not considered significant.

14. Air Quality

The air quality in the area is considered good. Impacts on air quality occur from automobile exhaust, smoke from residential wood burning stoves, smoke from the saw mill and talc mill south of Dillon, rangeland burning to improve forage for domestic livestock and wildlife and the seasonal burning of timber harvest residues on both private and Forest lands. Due to topography and weather patterns, pooling and inversions of stagnant air do not normally occur.

The Clean Air Act established wilderness as Class I air quality areas. Protection of air quality will be a critical factor in the management programs for the Forest's portion of the Anaconda-Pintler, and Lee Metcalf Wildernesses. Protection of air quality in these areas will be considered during fuels management programs occurring adjacent to the wilderness (USDA, n.d.).

IV. ENVIRONMENTAL CONSEQUENCES (Chapter IV)

Introduction

This chapter forms the scientific and analytic basis for comparison of the alternatives, including the proposed action, described in Chapter II. Environmental consequences are the expected effects of activities scheduled to implement an alternative. The applicable effects of all the major activities and resource programs are discussed. In the process, economic and social effects are discussed where applicable. Further discussion of effects and comparisons between alternatives and benchmarks is located in Chapter II.

Effects shown in tabular data and discussions relating to the first decade are based on planned management actions. Effects for other decades are projections based on continued implementation of the alternatives. These may change following future revisions, updates, or as a result of monitoring activities.

The place a particular activity or program occupies in this chapter has nothing to do with its importance. The consequences or environmental effects of a particular activity are described as quantitative or qualitative changes from the current situation in terms of significance, magnitude and duration. Where applicable, the discussion identifies consequences that are direct, indirect, cumulative, or unavoidable. The relationship of short-term use of resources to long-term productivity is also discussed along with irreversible and irretrievable commitment of resources.

This chapter also discusses mitigating measures which have not been previously mentioned. Few if any additional measures are identified. In the planning process, mitigation was incorporated into formulation of standards and guidelines, prescriptions and minimum management requirements associated with each of the alternatives. These items are discussed in other parts of this document or in special sections of the appendices and will not be repeated here.

The information contained in this chapter will be presented in a way which attempts to avoid redundant statements. For instance, the specific activities generated to enhance fish habitat are limited to a few acres on the Forest. However, the efforts to maintain or improve fish habitat are inherent in several other activities (timber harvest, road building, livestock grazing, etc.). The discussion for specific activities associated with fish habitat improvement is short but effects on fish habitat are discussed in sections related to other activities or resources. To assist the reader in locating all discussion associated with a particular resource, use or activity, the following index was developed specific to this chapter:

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Program or Activity	Page
Air Quality	19,25,27,34,42
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Boundary Location	39
Buildings and Grounds	40
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Wildlife Habitat	7,8,17,18,29,42,48,57,59,79 70, 74

Summary of changes between Revised Draft and Final EIS

Much of this chapter has been revised and expanded to address public comments and revised analysis requirements relating to the Environmental Impact Statement. All discussions of effects include evaluations relating to the two additional alternatives S and Sa, developed following public review of the Revised Draft EIS.

Other changes in this chapter have occurred due to changes in management direction, internal concerns, or in attempt to respond to public comments received. Major changes are as follows:

The acres of existing wilderness have been updated. Due to land exchanges occuring in the Taylor/Hilgard section of the Lee Metcalf Wilderness area the Beaverhead National Forest portion of the area has been expanded from 91,021 to 101,429 acres.

A variety of nongame wildlife species occurs on the Forest. The effects of management on these species has been expanded.

Additional constraints to protect wildlife habitat have been placed on the additional alternatives S and Sa. A description of the constraints and their expected effects on other resources are discussed in the Wildlife Habitat section.

Planned management activities will mostly affect potential stream fishery habitat. Tabular data displayed in the Revised Draft EIS combined stream and lake fisheries. The tablular data has been modified to show only stream related data.

An explanation of the "blowout" protection measures required by the Bureau of Land Management during oil and gas drilling operations has been added to the Minerals section.

Management activities may directly affect the proposed Continental Divide Trail, and the proposed Nee-Me-Poo National Recreation Trail located on the Wisdom Ranger District. A discussion of the possible effects has been added to the appropriate sections.

Both even-aged and uneven-aged silvicultural systems and associated harvest methods are appropriate for use on the Forest. Each are appropriate for use under specific physical limitations of the sites, the species involved, and within other resource considerations. The discussion of silvicultural systems has been expanded to clarify and explain the types of situations where each system might be appropriate. The selection of any silvicultural treatment for a specific area is determined by a certified forest silviculturist. Treatments are proposed only following an on-the-ground examination of the site and completion of a silvicultural prescription which explores alternative treatments where available.

The discussion of Visual Quality Objectives (VQOs) has been modified. VQOs remain constant regardless of the alternative applied. The degree of visual effect is directly related to the amount of the Forest which is assigned management prescriptions which allow resource development.

A section on Research Natural Areas has been added. Many of the areas described in Chapter III are proposed or candidate areas. Final designation of areas may have an effect on other resources.

Numerous editorial changes have occured for purposes of clarity. These changes are designed to retain original content and will not be listed separately in this section.

Programs and Activities and Their Associated Effects

This section addresses the Forest specific environmental Consequences that result from the various Forest management activities associated with each alternative. Each Forest has a unique set of activities that produce unique types and amounts of effects. The following display includes a sample outline of the required components to be discussed for each program and activity.

Resource - Describes the resource activities and the anticipated effect on other forest resources.

Short-term Use vs. Maintenence and Enhancement of Long-term Productivity - Describes the effect of planned management practices on the long-term productivity of both the resource for which the management occurs and other affected resources.

Irreversible and Irretrievable Commitment of Resources - Describes those actions which require a permanent commitment of a resource to a use and the values forgone.

Adverse Effects Which Cannot be Avoided - Describes those adverse effects occurring from management actions which are unavoidable. This section also describes what mitigation measures will be applied to ameliorate the adverse effect.

Conflicts With the Objectives of Other Agencies' Land Management Plans, Policies or Controls - Generally describes management actions which may conflict with the objectives of other agencies' land management plans when the interests of the agencies in the affected resource is shared.

Energy Requirements - Describes either in narrative or quantitative form, the amount of energy required to implement the planned management activity.

A. Wilderness

The Forest presently contains 173,500 acres of classified wilderness located in the Anaconda-Pintler and Lee Metcalf Wilderness Areas. These areas currently receive an estimated 150,000 Recreation Visitor Days (RVDs) of use annually. The amount of inventoried roadless land recommended for additional wilderness classification in each alternative is dependent on the goals and objectives for that alternative. There are no specific acitivities associated with wilderness classification, although wilderness designation can have impacts on other resource uses and values in an area. Activities that can occur in wilderness are designed primarily to facilitate and disperse use, restore overused areas and manage livestock use. These activites, primarily trail construction and maintenance, are discussed in Section D of this chapter in the Recreation discussion. Acres of wilderness in each alternative are shown in Table IV-1.

Table IV-1

Area Designated as Wilderness (Established and Proposed)
(thousand acres)

Alternative/Benchmark														
A	B	C	D	F	G	H	DEPT	Ha	I	S	Sa	W	MAX PNV	MIN LVL
338	174	1107	946	620	236	337	337	337	1416	343	343	489	174	174

The acreage figures displayed in the table indicate that the goals of Alternatives C and I provide for substantial increases in amount of wilderness. Alternative I represents the maximum area available for wilderness classification by retaining the existing 173,500 acres of existing wilderness and designating all 1,246,000 acres of currently unroaded lands to wilderness. Alternatives D, F, W, S and H propose 62 percent, 36 percent, 25 percent, 14 percent and 13 percent of the inventoried roadless lands for wilderness classification. Alternative A represents Current Level management and indicates that some areas are recommended for wilderness classification in the 1978 Land Management Plan. Alternative G proposes fewer wilderness additions than the 1978 Land Management Plan and Alternative B proposes no additional wilderness classification, retaining only those acres already classified.

Wilderness classification can reduce PNV and the Forest's contribution to the local economy, because the possibility of timber harvest is precluded on the portion of the inventoried roadless lands that are tentatively suitable for timber production. This portion varies from alternative to alternative. Although some of this volume may be restored by more intensive management of the areas remaining available for development (such as in Alternative C), more intensive management is costly both economically and in terms of impacts on other resource values, including wildlife and recreation. On the other hand, those businesses and individuals dependent on recreation will benefit from the classification of wilderness due to the increase of the recreation opportunities. Recreation opportunities could change, depending upon the area recommended for classification and the acreage total associated with each alternative. Some areas, currently popular among trail bikers and snowmobilers would no longer be accessible for those activities.

Alternatives which propose wilderness classification for areas along the proposed Continental Divide Trail will protect the trail corridor from being crossed with utility corridors, roads or other resource development in those areas.

Short-term Use vs. Maintenance and Enhancement of Long-term Productivity - The establishment of Wilderness has an effect on long-term productivity. Although native productivity of resources is maintained and biological gene pools are protected at maximum levels under wilderness classification, opportunities to increase timber productivity through management and to improve wildlife habitat are limited to the management of natural fire. The maintenance of primitive recreation opportunities is maximized and maximum protection is given to old growth timber and its associated wildlife habitat. Threatened or endangered plant and animal species are protected but little can be done to improve their habitat. Natural appearing landscapes are preserved although buildup of natural fuels may increase risks of wildfire.

Irreversible and Irretrievable Committment of Resources - Establishment of Wilderness areas through an act of Congress effectively commits those areas to Wilderness management. Although it is possible for Congress to revoke the Wilderness classification, an intensive analysis and much public involvement would be prerequisite. Revocation of classification is not anticipated in the near future. Classification results in an irretrievable loss of timber volume and in most cases precludes the exploration for and removal of mineral resources.

Several of the alternatives will entail irreversible and irretrievable impacts on the mineral resource. Chapter II includes a display that relates mineral favorability to limitations on access opportunities. Category A includes wilderness (established and proposed). Mineral favorability is described in Appendix C for each inventoried roadless area.

Adverse Effects Which Cannot be Avoided - Wilderness classification precludes the introduction and use of modern conveyances and conveniences such as motorized vehicles, chainsaws, houses, developed campgrounds and so on. Removal of both timber and mineral resources is prohibited. Some hard rock mineral activity can occur depending upon the history of development and the specific wording of the legislation. Although domestic livestock grazing is permitted if it has historically occurred, more intensive utilization and improvement of allotments would not be allowed nor would development of new allotments be permitted. Control of insects, diseases and noxious weeds is generally restricted or extremely costly because of the techniques required.

Conflicts With the Objectives of Other Agencies Land Management Plans, Policies or Controls - Wilderness classification is based on the desires of the public as interpreted by Congress. Therefore, generally no unacceptable conflicts with other land management plans would occur. Recommendations for the Mt. Jefferson area (1-962) has been deferred so that wilderness/nonwilderness recommendations could be coordinated with the Bureau of Land Management and the Targhee National Forest. Wilderness recommendations for areas contiguous with inventoried roadless areas on other National Forests and the Bureau of Land Management have been coordinated with the responsible agency. Many areas available for wilderness designation are currently leased for minerals or oil and gas exploration. If areas are designated wilderness by Congress, the options of cancelling or continuing leases will be resolved.

Energy Requirements - Energy is not expended in wilderness classification. Energy requirements for managing the recreation resource in wilderness is shown in Table IV-4.

B. Unroaded Management

The amount of unroaded management (external to wilderness) in each alternative depends on the goals and objectives for that particular alternative. Unroaded management areas include those areas assigned management prescriptions that specifically emphasize recreation opportunities, domestic livestock forage utilization, and/or wildlife management and areas where management activities will be minimal. In all areas, recreation, range and wildlife activities are compatible . Mineral development is also compatible in some areas and road construction necessary for exploration and development may alter the unroaded nature of the area. The activities associated with the recreation, range, wildlife and mineral resources will be discussed in those sections.

Acres of unroaded management in each alternative are shown in Table IV-2.

Table IV-2

Acres of Unroaded Management
(thousand acres)

Alternative/Benchmark

A	B	C	D	F	G	H	DEPT	Ha	I	S	Sa	W	MAX PNV	MIN LVL
1000	1045	281	670	656	1051	1116	1116	1061	174	1136	1114	784	989	1544

It is apparent from the table that the relationship between wilderness classification and unroaded management acreage is generally an inverse relationship. Thus, Alternatives C and I have high wilderness acreages and low unroaded management acreages. Alternative S has the highest level of unroaded management acres in an effort to retain the diversity of settings for primitive and semi-primitive nonmotorized and motorized recreation currently available. Alternatives B and G represent the amount of unroaded management area that would occur without much additional wilderness recommendation and if timber harvest is scheduled using primarily economic criteria on the potentially suitable timberland. Acres in unroaded management in excess of that level can reduce PNV and contribution to the local economy of the Forest because regulated timber harvest is precluded. To some extent, the foregone timber volume could be recovered by more intensive management on other areas.

Those businesses and individuals dependent on recreation economically may benefit since this increases or at least maintains the existing recreation opportunities. The diverse array of recreation activities currently pursued on the Forest, -- ORV travel, cross country skiing and so on--would be available in a variety of unroaded settings. Use could increase in areas now specifically managed for recreation uses, but otherwise status quo generally would be maintained.

Habitat security for big game is greater in alternatives which propose large amounts of unroaded management. These areas provide cover for big game particularly during hunting season and increase the possibility of game animals reaching trophy size.

The effect of increased unroaded management acres instead of wilderness classification would be to maintain the opportunities for wildlife habitat improvement activities, possible mineral development, continued use of off-road recreation vehicles (snowmobile and trail bikes) and increases in livestock grazing through improvements.

Short-term Use vs. Maintenence and Enhancement of Long-term Productivity - Unroaded management designation is generally designed to enhance long-term productivity of a resource that is or may be threatened by development. However, the assignment of acreage to unroaded management has some effect on long-term productivity of certain resources. The inherent productivity of resources is maintained but the opportunity to make the area more productive through intensive management is foregone. Unroaded management maintains the opportunity for semi-primitive recreation, low intensity domestic livestock grazing and is important in the maintenance of old-growth timber and its associated wildlife habitat. Natural appearing landscapes are preserved although the opportunity for more intensive wildfires is increased by the build-up of fuels. The impact of development on critical wildlife areas assigned unroaded management is minimized. Security cover for big game species is retained.

Irreversible and Irretrievable Committment of Resources - Unroaded management assignment is not irreversible but once the designation is made, change must be subjected to an intensive analysis, including public involvement. Where the management prescription permits road construction for mineral development, both energy and non-energy, the unroaded nature of the area may be lost in the short term but regained eventually through rehabilitation of the road. Unroaded management results in an irretrievable loss of certain renewable resources such as timber that are produced but not harvested.

Adverse Effects Which Cannot be Avoided - Timber harvest is not scheduled in areas assigned to unroaded types of management. In some situations, the possibility of mineral exploration and development is limited or made more costly because of the difficulty of access. Many types of wildlife and fish habitat improvements may be impossible or expensive to accomplish. Control of insects, disease, wildfire and noxious weeds will require special and sometimes inefficient techniques.

Conflicts With the Objectives of Other Agencies Land Management Plans, Policies or Controls - As described above for wilderness, unroaded management of contiguous areas are coordinated with the planning efforts of the Bureau of Land Management and other National Forests. Roadless area #1427 contains a small area on which the Louisiana Pacific Corporation retains timber rights. The area is generally not considered suitable for timber harvest; however, the conflict should be resolved prior to or through the designation process.

Energy Requirements - Some energy may be used to maintain recreation facilities (primarily trails) but this use is associated with recreation. Energy expended by the public in dispersed recreation is shown in Table IV-4.

C. Developed Recreation

Over fifty developed recreation sites are located on the Forest, including campgrounds, picnic areas, boating sites, an organizational site, ski area and recreation residences. These sites occupy a relatively small amount of land and have little or no effect on management of other resources other than requiring that visual quality as viewed from the site is maintained. Environmental consequences of retaining these sites are severe on the specific location. Due to the use of pavement and gravel, vegetation is destroyed or significantly changed, soil is compacted and water infiltration is slowed while overland flow is increased. Pavement and gravel are necessary to prevent even more severe vegetation, soil and water effects due to excessive trampling.

Developed recreation sites on the Forest provide a potential capacity of 494,000 RVDs per year. While actual use is much lower than capacity (179,000 RVDs per year), many of the developed sites receive levels of use at or near optimum at certain times of the year. The current level of developed recreation opportunities available at campground and picnic areas is adequate to meet projected levels of use for at least the next fifty years. Projected levels of use are displayed in Table IV-3.

All existing developed sites are maintained in all alternatives and no additional facilities are proposed for construction.

The lower the emphasis on developed recreation, the greater the risk of environmental degradation from pollution from sewage facilities, garbage problems and vandalism. Developed recreation is more emphasized in Alternatives B, D and H than in Alternatives A, G and I. In alternatives where developed recreation is a low emphasis item, the result could be a lower quality experience and greater risk of environmental degradation should these alternatives be selected.

Table IV-3

Anticipated Use at Developed Sites
(thousand recreation visitor days per year))

	Decade		
	1	3	5
Anticipated Use (Thousand RVD's/year)	190	284	379

Developed recreation sites are high cost per acre facilities due to construction, maintenance, cleanup, monitoring and policing. Some income is generated because user fees are currently charged at many sites, however, this extra income has a negligable effect on the PNV of the Forest and even fails to offset the cost of Forest-wide developed recreation activities. The decision could be made to charge higher fees or fees at more sites if requirements for determining charges were changed.

Since the total area used by developed recreation is so small, it has little effect on the economics of businesses which depend on natural resources. The exception is the Maverick Mountain Ski Area which receives considerable use in the winter months. The resorts operating under special use permit on the Forest also benefit from the developed recreation opportunities afforded by the National Forest. Those businesses which serve or cater to recreationists, such as river outfitters, sporting goods stores, gas stations and so on, may benefit slightly by the existence of campgrounds in the vicinity. On the other hand, campgrounds developed by the Forest Service may in some cases provide competition with privately developed recreation facilities in the area.

The retention of the existing developed sites is expected to have no adverse impact on the lifestyles, land use patterns, or values of local residents. Developed recreation facilities are very important to many Forest users--this is what the National Forest and "Forest Service" is to many people. Developed sites reduce indiscriminate "roadside" Forest use and resource impacts; concentrating use in areas that are designed for that concentrated use. Closing or reducing the level or intensity of management of high use facilities would generate protests from the public and could result in increased use of adjacent areas not suited to that use. Similiarly, increases in fees could result in protests from those people who feel they have a right to use National Forest campgrounds with little or no fee charged.

Short-term Use vs. Maintenence and Enhancement of Long-term Productivity - The construction and management of these developed sites will have an adverse effect on the long-term productivity. The vegetation of much of the site will be replaced by graveled or paved roads and camp spots. The vegetation on much of the remainder will be suppressed by the concentrated trampling of the users. These effects would remain evident for a long period of time even though the sites were abandoned. Efforts to restore the sites to previous productivity would be costly.

Irreversible and Irretrievable Commitment of Resources - Once established, these sites are likely to be maintained and become an irreversible, long-time commitment of a resource. Wood fiber and forage which would have been produced on the sites is irretrievably lost.

Adverse Effects Which Cannot be Avoided - Much of the vegetation on these sites will be lost or suppressed. Dust and noise from the concentration of campers will exist. The opportunity for vandalism will be present due to the numerous and costly facilities concentrated in one place. Most wildlife habitat in the area will be destroyed or vacated.

Conflicts With the Objectives of Other Agencies' Land Management Plans, Policies or Controls - Construction and management of campground facilities may be construed as competition with privately owned facilities. However, these sites are frequently used by the local population and also provide rest and camping sites for tourists. These sites represent a historically accepted use of National Forest land and efforts to eliminate or drastically change this use would be opposed by local people.

Energy Requirements - Energy will be used in the cleanup and maintenance of these sites. Most campgrounds will require administration and fee collection on a regular basis and yearly maintenence of the facilities will be energy consumptive.

D. Dispersed Recreation

Dispersed recreation occurs on land and water which is not developed for intensive or concentrated recreation. Specific management activities associated with dispersed recreation include maintenance or construction of facilities such as trails, trailheads, toilets, hitch racks, stock ramps, parking areas and information signs to enhance the recreation experience of the Forest visitor and to protect other resources. Dispersed recreation can occur in areas where none of these activities have been undertaken because the recreationist is seeking a recreation setting or experience where these activities are not needed.

The majority of the dispersed recreation on the Forest occurs during hunting season. However, throughout the remainder of the year, the National Forest provides a diverse array of opportunities--fishing, hiking, snowmobiling, trailbike use, riding, and photography opportunities. The topography of the Forest permits extensive use of off-road-vehicles (ORVs). A significant proportion of the Forest is accessible by motorized vehicle and that is a popular means of accessing areas.

Dispersed recreation can be subdivided into that associated with roaded environments and that associated with unroaded environments. The amount of each which is available within each alternative is dependent upon the goals and objectives of the alternative, including the acreage of unroaded management and wilderness designations and the miles of roads constructed. Dispersed recreation in unroaded settings can also by categorized by motorized and nonmotorized opportunities and by the "primitiveness" or isolation of the setting.

In all alternatives, the amount of National Forest available to meet projected levels of use in several categories of dispersed recreation --Type I (primitive nonmotorized), Type II (semi-primitive) and Type III (roaded)--is expected to be more than adequate. All alternatives provide capacity in excess of demand through at least the next five decades.

The effects of the activities associated with dispersed recreation on soils, water and vegetation are similar to the effects discussed for developed recreation sites although costs per acre for maintaining these sites may not be as high. Although the acreage available for dispersed recreation may be quite high (if all categories are totaled, the acreage available equals the entire National Forest acreage), the associated facilities identified above occupy only a small acreage.

Unroaded-motorized areas provide opportunities for people to have semiprimitive recreation experiences with the convenience of snowmobile, motorcycle, or chainsaw use. Wilderness management precludes the use of such mechanized equipment and provides solitude in the recreation experience. Roaded areas provide the broadest spectrum of recreational use and, if roads are closed, can approximate unroaded conditions with the exception of the physical existence of roads.

If projected use were to approach capacity, recreation could be limited to acceptable levels by a permit system or the quality of the recreation experience would be degraded. Shifts in the amount of land available for recreation opportunities and changes in the quality of that land could lead to shifts in the amount of recreation use occurring in each category. However, because many other factors influence the types of recreation opportunities sought (price of gasoline, land uses on non-Forest lands, weather, for example), it is impossible to predict shifts.

Excessive use in either the semiprimitive or wilderness setting can cause erosion, soil compaction and loss of vegetation along main trails and at the more desirable campsites. These are minor effects from the total Forest standpoint but are important esthetic effects to those people using the trails.

Direct revenue from dispersed recreation is insignificant, but because values have been assigned to recreation visitor days, dispersed recreation has a positive affect on the present net value of the Forest.

The effect of emphasis on recreation on the lifestyles and the economy of area are identical to those discussed under Wilderness and Unroaded Management.

Short-term Use vs. Maintenence and Enhancement of Long-term Productivity - The short-term use (construction and maintenence) of trailhead facilities, toilets, hitchracks, stock ramps and loading areas will have similar long-term effects on productivity as developed recreation sites. Although trails can be abandoned and may eventually return to near original condition, this is not likely to happen as long as the demand for dispersed recreation remains high.

Irreversible and Irretrievable Commitment of Resources - Once facilities and trails are constructed, they are likely to be maintained into the foreseeable future. The vegetation displaced by these facilities constitutes an irretrievable loss of resources.

Adverse Effects which Cannot be Avoided - The loss of vegetation displaced by the construction and maintenence of the facilities and trails cannot be avoided. These facilities and trails will tend to concentrate use in certain areas and along certain routes. Despite care and maintenance, soil erosion will occur and water flow may be diverted along new channels. Maintenance of areas in a unroaded condition will limit or preclude timber harvest and limit opportunities for (increasing costs of) mineral exploration and development.

Conflicts With the Objectives of Other Agencies' Land Management Plans, Policies or Controls - No conflicts with other land management plans are likely to occur as a result of dispersed recreation activities.

Energy Requirements - Energy is required for the maintenence of dispersed recreation facilities but at less volume than for maintenence of developed recreation facilities. Some energy is required to clear and maintain trails but this is small compared to total energy use on the Forest. There may be increased energy requirement to maintain roads for dispersed recreation when they are no longer needed for timber management. The major use of energy associated with dispersed recreation is that used by the public in travel to and from the Forest and by the public in pursuit of activities while on the Forest (Table IV-4).

Table IV-4

Energy Used in Dispersed Recreation During the First Decade
(Million B.T.U.'s)

Alternative/Benchmark														
A	B	C	D	F	G	H	DEPT	Ha	I	S	Sa	W	MAX PNV	MIN LVL
155	155	155	155	155	155	155	155	155	155	155	155	155	155	155

F. Cultural Resources

The Forest has a rich cultural history, including prehistoric sites, portions of the Lewis and Clark Trail, old ghost towns and the Bighole Battle Field located adjacent to Forest lands. "Cultural resources" refers to the Forest's archaeological and historic properties which are nonrenewable resources making it necessary to maintain their scientific, historic and social integrity. Prehistoric and historic resources are cataloged and/or preserved through the Forest's cultural resource management program in compliance with the various Federal laws, regulations and policies.

In all alternatives, an inventory of sites where ground-disturbing activities are planned will be required. If a prehistoric or historic site is found before or during ground disturbing activity, it will be documented and evaluated for possible preservation. Alternatives which emphasize resource development will produce more ground disturbing activities, and thus have a greater probability of impacting cultural resource sites. Cultural resources will be managed in all alternatives to ensure protection of the resource.

Protection of the cultural resources usually will have little effect on Forest resource production levels because generally few acres are involved. However, the costs of ground disturbing activities may be increased due to need for cultural resource inventories. If a site must be excavated or a project redesigned to avoid impacts, costs will be higher. Protection of the site may preclude development of the facilities needed for intensive area management. Even though a cultural resource inventory will be made prior to ground disturbing activities, these surveys may not always be successful in finding a cultural resource prior to the start of activities. Should unidentified sites be discovered, the ground disturbance will be delayed while the area is inventoried and mapped. Analysis may indicate the need for excavation or project redesign. Some timber may not be harvested on or near historic trails and other identified cultural sites but this volume will be small.

Short-term Use vs. Maintenence and Enhancement of Long-term Productivity - The protection given to cultural sites will have some effect on the long-term productivity. The vegetation on and near the sites will not be harvested or will be harvested at less than maximum intensity. Consequently, although the native productivity may be maintained in these areas, opportunities to increase production through intensive management will be foregone. Even though cultural surveys will be made prior to ground disturbing activities, these surveys may not always be successful in finding a cultural resource prior to the time the activities occur. Should this happen, the ground disturbing activity will be delayed while the area is inventoried and mapped. Analysis of the results of this inventory may show that the activity needs to be diverted away from the site or that the resource needs to be collected and/or catalogued before the activity proceeds. This can cause delay and, if the area is to be completely protected, will affect the long-term productivity of the site.

Irreversible and Irretrievable Committment of Resources - The cultural resources which are given protection will have an effect on the vegetative resources within the area. Since the commitment to protect cultural resources is irreversible in the foreseeable future, the harvestable vegetation grown on these sites represents an irretrievable loss of that resource.

Adverse Effects Which Cannot be Avoided - Some ground disturbing activities will inadvertently enter and disturb some cultural resources despite the care and intensity of surveys prior to the beginning of these activities. If this happens, some cultural resources will be lost and the activity will be halted until an adequate survey and analysis is made. Thus, the activity will be delayed and perhaps diverted. It generally will be impossible to determine the magnitude of the losses in cultural resources.

Conflicts With the Objectives of Other Agencies Land Management Plans, Policies or Controls - The management of the cultural resource should have little effect on other planning efforts adjacent to the Forest.

Energy Requirements - Managing the cultural resource will require little energy expenditure. Some travel will be necessary in the surveys and some energy may be used excavating or cataloging sites that are located. This energy will be only a minor portion of the total Forest expenditure.

E. Research Natural Areas

The Forest currently maintains two Research Natural Areas, and has a number of areas being considered for inclusion into the system, refer to chapter III. Following formal designation, these areas are protected from management activities to preserve the natural conditions to the extent possible. This protection precludes domestic livestock grazing, timber harvest and road construction for other than access purposes. The areas are generally proposed for mineral withdrawl.

To avoid conflicts, these areas are generally located in wilderness or areas not scheduled for resource development; however some conflicts may occur. The two existing Research Natural Areas comprising 2,429 acres contain suitable livestock rangeland. The areas are fenced to exclude livestock and the usable forage is unutilized. Neither the existing nor proposed areas contain timber suitable for regulated timber harvest.

Short-term Use vs. Maintenence and Enhancement of Long-term Productivity - Designation of Research Natural Areas precludes intensive management activities which could improve long term productivity of the site for other forest resources; however, the existing productivity of the site will be retained.

Irreversible and Irretrievable Commitment of Resources - Designation of Research Natural Areas generally committs the area to that use into the future. The forage left unutilized by livestock in Research Natural Areas is irretrievable. Where suitable timber exists, the volume of possible timber harvest is lost.

Adverse Effects Which Cannot be Avoided - Timber harvest and livestock grazing are not scheduled in Research Natural Areas. The possibility of mineral exploration and development is limited or made more costly because of imposed restrictions. Many types of wildlife and fish habitat improvements may be impossible or expensive to accomplish. Control of insects, disease, wildfire and noxious weeds will require special and sometimes ineffecient techniques.

Conflicts With the Objectives of Other Agencies Land Management Plans, Policies or Controls - Major conflicts associated with Research Natural Areas involve livestock grazing and mineral exploration and development. Control of grazing may require fencing which may affect livestock movement in adjacent areas. Restrictions on mineral exploration and development may conflict with existing plans.

Energy Requirements - Some energy will be required if Research Natural Areas are fenced to exclude domestic livestock and some used to maintain existing fences.

G. Threatened and Endangered Plant and Animal Species

The Forest currently provides habitat for endangered bald eagle and gray wolf, the threatened grizzly bear and potential habitat for the endangered peregrine falcon. For a complete discussion of the extent and use of the Forest by threatened and endangered species, refer to Chapter III. All alternatives will provide and protect habitat for these species.

The Forest is an active participant in the Greater Yellowstone Bald Eagle Management Plan. All Forest activities will be designed to protect existing bald eagle nesting sites, to retain perch trees adjacent to lakes and rivers used by the eagle for fishing. In some cases habitat improvement activities such as modifying individual trees to provide suitable nesting platforms will be undertaken.. These activities may preclude timber harvest, road construction, seismic exploration, and other disturbing activities in some small areas surrounding key sites when they are occupied.

The Forest is an active participant in the Continental Divide Gray Wolf Coordination Plan (USDI, 1983). Under all alternatives, a biologic evaluation will be made prior to management activities in suspected gray wolf habitat. If potential conflicts are identified, the Forest will consult with the U.S. Fish and Wildlife Service. Habitat protection measures may include closing roads in areas of suspected use during portions of the year or timing management activities to avoid adverse impacts. Alternatives which propose wilderness classification for suspected habitat avoid most major conflicts between the wolf and management activities..

The Forest contains no areas identified as "occupied habitat" in the Greater Yellowstone Grizzly Bear Recovery Plan (USDI, 1982); however, the grizzly bear is suspected of inhabiting portions of the Madison Range within the Lee Metcalf Wilderness, and is an occasional visitor to the Tobacco Root Mountains and Gravelly Range. The area of suspected use in the Lee Metcalf Wilderness will remain in wilderness status under all alternatives. This will minimize adverse impacts to the bear in that area. Because none of the Forest is officially designated "occupied habitat", grizzly bears which become problems to humans or livestock will probably be relocated to "occupied habitats".

The peregrine falcon does not currently occupy the Forest but may migrate or be artificially introduced in the future (USDI, 1977). Potential habitat occurs along rocky cliff type habitats not currently planned for Forest management activities under any alternative.

There are currently no plant species classified as threatened or endangered occuring on the Forest. However, Penstemon lemhiensis may occur on the Forest and is listed as a species that is considered as appropriate for listing as endangered or threatened (Peterson, 1983). The species may occur in areas where livestock grazing is permitted and protection may be necessary.

Short-term Use vs. Maintenence and Enhancement of Long-term Productivity - Short-term use of resources involves continued monitoring to determine the actual use of the Forest by threatened and endangered species. Should the need arise, restrictions may be applied to other resources to protect the involved species.

Irreversible and Irretrievable Committment of Resources - There is no irreversible or irretrievable committment of resources.

Adverse Effects Which Cannot be Avoided - There are no adverse effects associated with threatened or endangered species monitoring.

Conflicts With the Objectives of Other Agencies Land Management Plans, Policies or Controls - Forest management activities will be designed to avoid conflicts with all management plans and coordination programs designed to protect threatened and endangered species.

Energy Requirements - There are no energy requirements associated with threatened and endangered species at this time.

H. Wildlife Habitat

This section deals with the effects of wildlife management on other Forest resources. The effect of other resource management activities on the wildlife resource is described in detail under the appropriate resource heading.

Portions of the Forest in the Madison and Gravelly Ranges are included in the Greater Yellowstone Area. This area encompasses portions of a number of National Forest, Yellowstone National Park, Bureau of Land Management and U.S. Fish and Wildlife Service lands. The Beaverhead coordinates with these agencies in the management of the area.

The maintenence of wildlife habitat has an effect on several of the other Forest resources. Several of the alternatives were developed with constraints to protect wildlife habitat in accordance with principals presented in the Cooperative Montana Elk Logging Study.

Alternatives D, F and W contain constraints which prohibit harvests in all regenerated stands until age 120 and restricts the liquidation of existing mature stands Forest-wide to 10 percent per decade, thus limiting the total removal of the existing mature stands to be extended over the next 100 years. Theses constraints do not affect early decade timber harvest levels, but do slightly affect the spacial distribution of the harvest. Outer decade harvest volumes are affected due to the effects of extending the harvest age of regenerated stands.

Alternatives H and Ha contain identical constraints as described above except the 120 harvest limitation on regenerated stands was only applied to those areas assigned wildlife prescriptions.

Constraints applied to alternatives D, F, W, H, and Ha have little effect on harvest volumes scheduled in the first decades, but tend to impact long term harvest volumes.

Alternatives S and Sa contain additional requirements for the maintenence of wildlife security cover. These requirements restrict the amount of timber which can be harvested in an area at any given time, and limit the reentry period in many areas until security cover is returned to harvested stands. In an attempt to model these restrictions, the following constraints were applied. The 120 year harvest age constraints applied to regenerated stands in alternatives D, F, W, H and Ha were retained. In addition, the liquidation of the existing mature sawtimber located within the timber base is constrained to 10 percent per year for the first five decades. To retain sufficient acreage of oldgrowth mixed conifer stands, the constraint was applied separately to the lodgepole pine and mixed conifer types so that one type is not harvested proportionally faster or slower than the other. These constraints reduce the amount of timber scheduled for harvest in the first few decades and increase the risk of mortality from mountain pine beetle in the lodgepole pine types.

All alternatives limit the amount of domestic livestock grazing to 35 percent of available forage on big game winter ranges. This ensures an adequate amount of forage is available to grazing wildlife, primarily elk. This is achieved through restrictions on the timing and intensity of domestic livestock use on allotments located on the winter range.

Several types of habitat improvements are planned by the Forest. The transition zone between the Douglas-fir and the sagebrush/grass types is generally important to wildlife for winter range. Douglas-fir encroachment on these bunchgrass types may reduce the amount of forage available for livestock and wildlife. Prescribed fire is used to remove the encroaching Douglas-fir and to stimulate the growth of palatable forage species. Some burning on these sites will also be designed to rejuvenate decadent vegetation. These sites are generally not suitable for timber production due to the low productivity of the site. Some soil is exposed by burning, increasing the possibility of erosion, however, the site recovers rapidly (usually within the same growing season). Smoke created during burning projects reduces air quality.

Other wildlife projects include: rejuvenating aspen stands with fire or mechanical means to provide better aspen age class distribution for wildlife use, rejuvenating willow bottoms to provide forage for moose and some fencing of key habitat components to reduce competition between big game and livestock. The fencing of primary livestock range will facilitate the management of livestock, allowing a more efficient use of available forage. Other habitat improvement projects include pothole blasting for waterfowl, nestbox development, planting and seeding of forage species and some water development. These activities involve very small areas and do not entail significant effects on other resource activities or resources. Maintenence of existing improvements such as periodic repair of fences and watering devices is necessary to maintain the usefulness of the improvements. The funding available for wildlife improvement and maintenence projects for each alternative is based on the general need to mitigate the effect of developmental activities on the wildlife resources. Funding available by alternative is shown in Table IV-5.

Table IV-5
Wildlife Habitat Improvement and Maintenence Funding.
(thousands of dollars per year)

Alternative/Benchmark

Wildlife Habitat Improvements

A	B	C	D	F	G	H
00.0	24.6	00.5	18.4	65.6	20.8	14.4

Ha	I	S	Sa	W	MIN LVL
14.4	00.1	14.8	14.8	68.6	00.0

Table IV-5 (Continued)

Wildlife Habitat Maintenance

A	B	C	D	F	G	H
00.0	10.2	01.3	04.7	14.8	11.6	15.1

Ha	I	S	Sa	W	MIN LVL
15.1	0.49	15.6	15.8	16.0	00.0

Although elk is the major species of concern on the forest, other big game animals occur, including deer, moose, goats, bighorn sheep, black bear and mountain lion. Habitat improvement projects are scheduled to improve the habitat for many wildlife species.

A wide variety of nongame wildlife occurs on the Forest and are dependent upon a wide variety of habitats. Nongame animals are those not commonly hunted and include small mammals such as porcupines and rodents, bats, amphibians, nongame fish and nongame birds. Currently the Forest contains a disproportional amount of older age class habitats, both within the forested types and grassland communities. As management activities such as timber harvest and prescribed burning occur, the diversity of vegetative communities and development of younger age class habitats will increase. The diversity and populations of nongame species dependent on these habitats will increase commensurately. The effect of these changes on the dependant wildlife species will be evaluated by monitoring the effect on the wildlife indicator species described in Chapter III.

State wildlife agencies are responsible for management of wildlife, but have no direct management responsibilities for wildlife habitat on National Forest land. National Forest land managers will coordinate management activities with concerns expressed by the Montana Department of Fish, Wildlife and Parks regarding wildlife needs.

Measures designed to mitigate the effect of management activities on the wildlife resource include timing of timber harvest activities, the spacial distribution and location of harvest units, timing and location of road construction, and travel restrictions on constructed roads. These mitigation measures often increase the cost and reduce the economic efficiency of these management activities.

Short-term Use vs. Maintenence and Enhancement of Long-term Productivity - Increasing the harvest age of timber stands to maintain elk habitat security cover decreases the overall productivity of the site and increases the probability of damage from insects and disease. The productivity of areas that are burned, or rejuenated for wildlife will be changed. If trees are normal occupants of these sites, some or all may be killed. This is especially true of tree seedlings which may occupy the area. The production of vegetation prefered by grazing wildlife and livestock will be enhanced.

Irreversible and Irretrievable Committment of Resources - The volume lost by extending harvest ages is irretrievable. The act of burning and rejuvenating areas for wildlife, does not constitute an irreversible committment of the areas to this activity. Areas burned in any one year may never be treated again. Any species removed or suppressed by any of the activities does not constitute an irretrievable loss as the habitats will eventually evolve back to the pretreatment condition.

Adverse Effects Which Cannot be Avoided - Extending harvest ages increases the risk of damage from insects and disease. This is especially true in reference to mountain pine beetle in the the lodgepole pines types. Lodgepole pine types becomes susceptible to the beetle at about 80 years of age and the risk increases with age. Soil surface may be exposed by burning for a few days or weeks and there is a slight risk of accelerated erosion. Air quality degradation is similar to that from slash control but the acreage proposed for burning is small and smoke generation will be slight.

Conflicts With the Objectives of Other Agencies Land Management Plans, Policies or Controls - The objectives of Federal and State wildlife agencies and the National Forests are different. Therefore, plans for the management of the wildlife occupying Forest land may conflict when wildlife populations or habitat is affected. Coordination between agencies will be used to address and minimize conflicts.

Energy Requirements - Energy will be used to burn, or mechanically rejuvenate areas for wildlife improvement projects. Because there is small acreage involved, this energy use will amount to only a small percentage of the total energy used on the Forest.

I. Fish Habitat

Fishery habitat is an important resource on the Forest and the management of that habitat has an effect on several other resources.

Fishery habitat improvement projects are implemented to specifically increase the productivity of existing habitat, repair damage to habitat caused by natural or man-caused actions, or to mitigate the effects of current management actions. Specific activities for the improvement of fish habitat on the forest are: building of pool development structures, the installation of aeration devices to prevent fish winterkill, removal of natural barriers to fish movement or replacement of improperly positioned or designed culverts. The average fish gain per structure or acre of habitat improvement is estimated at at an average 20 catchables per year. (Lloyd 1983).

The projects scheduled each year affect very small areas and anticipated environmental effects are expected to be insignificant. The number of fishery habitat improvement projects planned for each year in the first decade varies by alternative by the general managment emphasis expressed by that alternative and are shown in the following table.

Table IV-6
Fisheries Habitat Improvement Projects.
(number of projects per year in the first decade)

Alternative/Benchmark														
A	B	C	D	F	G	H	Dept	Ha	I	S	Sa	W	MAX PNV	MIN LVL
3	20	5	11	16	10	16	16	16	16	16	16	16	10	0

To protect fishery streams in livestock grazing allotments, allotment management plans will limit the amount of livestock use in riparian areas to that amount which retains 60 percent of the overhanging vegetation along the stream channel. As allotment management plans are developed and reevaluated, a decrease the amount of grazing allowed in a pasture may occur.

Timber harvesting in riparian areas is limited to unevenaged silvicultural systems. Trees will be left along stream channels to eventually fall into the stream to form pools necessary for fishery habitat. The retention of these trees and implementation of uneven aged systems, increases logging costs and reduces harvest volume. Altenatives which schedule more timber harvest will require more harvesting and road construction in riparian areas.

Road construction in riparian areas requires measures to protect fishery habitat. These measures restrict the number and location of stream crossings, restrict the timing of construction to low flow seasons, and require the installation of structures which enable fish passage. These measures increase road construction costs, and decrease economic efficiency of the individual projects. All alternatives require the same mitigation measures for road construction in riparian areas; however, alternatives which schedule more timber harvest will require more construction through these types of areas.

The fishery streams on the Forest are important for the recruitment of fish to the downstream fisheries both on and off the Forest. The number of fish available for downstream recruitment is proportionally related to the total number of fish produced annually in Forest streams. The current potential recruitment to downstream fisheries is 157,350 adult fish per year. Implementation of management constraints placed on grazing within riparian zones produces proportionately large increases in potential fish populations from existing numbers in the first decade. Commensurate increases in downstream recruitment occur for the same reason and are reflected in the outputs. Other management activities such as road construction and timber harvest which adversely affect fisheries habitat will decrease potential populations and downstream recruitment in later decades. (Lloyd 1983). The amount of change in potential recruitment estimated for each alternative is displayed in Table IV-7. Total potential fish populations for each alternative are shown in Table IV-23.

Table IV-7
Potential Recruitment to Down Stream Fisheries
(change in numbers of available adult fish)

	DECADE				
ALTERNATIVE	1	2	3	4	5
A	+ 4600	+ 3330	+ 2260	+ 1740	+ 630
B	+ 3330	+ 2260	+ 1730	- 40	- 210
C	+ 4600	+ 3330	+ 2080	+ 1740	+ 325
D	+ 5320	+ 5145	+ 4600	+ 4415	+ 3510
F	+ 3330	+ 2260	+ 1750	+ 320	+ 140
G	+ 4415	+ 3330	+ 2260	+ 1730	+ 670
H	+ 5145	+ 4600	+ 4415	+ 3330	+ 3152
Ha	+ 4595	+ 3510	+ 4200	+ 2260	+ 2000
DEPT	+ 4600	+ 3330	+ 2260	+ 2250	+ 1750
I	+ 5145	+ 4775	+ 4595	+ 3330	+ 3330
S	+ 5190	+ 5190	+ 5190	+ 5190	+ 5190
Sa	+ 5190	+ 5190	+ 5190	+ 5190	+ 4560
W	+ 3330	+ 2260	+ 1750	+ 315	+ 140
MAX PNV	+ 3152	+ 1750	+ 325	- 1085	- 1250
MIN LVL	0	+18400	+18400	+18400	+18400

* First decade outputs are based on planned activities. Other decade figures are projected based on continued implementation of the alternative.

Fishing in the Forest and surrounding area is well publicized and is an important activity to many recreationists. The Forest and surrounding area is noted for "Blue Ribbon" trout streams and the abundance of small creeks and high mountain lakes. As with wildlife, coordination between the Forest and the Montana Department of Fish, Wildlife and Parks is required for management of fish habitat. The primary considerations given to protection of fisheries are associated with other activities (primarily timber harvest, grazing, mineral development and road management) and will be discussed in relation to these activities. Since accelerated fish habitat management usually increases fish populations (Lloyd 1983), resulting in increases in recreation activities, those businesses and individuals interested in fishing as recreation will benefit. There will be little or no effect on the lifesytles of the local population.

Short-term Use vs. Maintenence and Enhancement of Long-term Productivity - Imlementation of grazing controls in pastures, retention of pool recruitment trees in riparian areas and installation of habitat improvement projects will maintain and improve the productivity of the existing fishery habitat.

Irreversible and Irretrievable Commitment of Resources - The forage left unutilized by livestock in pastures containing fisheries streams is irretrievable. Trees retained in riparian areas for future pool development will not be harvested and the associated volume lost. There are few irreversible or irretrievable commitments of resources associated with fish habitat improvement projects because so little area is involved.

Adverse Effects Which Cannot be Avoided - Stream bottoms will be disturbed when fish barriers are removed and when other instream fishery improvement projects are constructed. This may have minor short-term effects on the fish and insects which occupy these areas.

Conflicts With the Objectives of Other Agencies Land Management Plans, Policies or Controls - The objectives of the State wildlife agencies and the National Forests are different. Management activities which alter or adversely affect fish habitat may cause conflicts. Coordination between agencies will be utilized to resolve or ameliorate conflicts.

Energy Requirements - Some energy will be required in removal of barriers and construction and maintenence of the fish hatching channel. This will be only a small portion of the total energy use of the Forest.

J. Minerals

During the next 10 years, the Forest's administration of minerals and energy related resource activities is expected to range between 325-375 cases until large numbers of oil and gas leases begin expiring in 1987 and beyond. Administrative workload could increase by 50-75 percent in the late 1980's as last minute oil and gas exploration prior to lease expiration increases and lease reissuance after expiration proceeds. At the present time, approximately 45 percent of administrative workload is related activities on mining claims, 45 percent is related to leasable minerals such as oil and gas and 10 percent is related to salable minerals such as decorative rock and gravel. The magnitude of the different workloads can be inferred from funding allocations. Currently 60-70 percent of the Forest's workload is related to nonenergy minerals (locatables and salables) and 30-40 percent of the workload is related to energy minerals (leasables). These percentages would be expected to change in the late 1980's, as oil and gas related activities increase dramatically. When existing leases on the Forest expire, the issuance of new leases will be based on further environmental analysis.

1. Locatable Minerals

The 1872 Mining Act authorizes the public to go on National Forest System lands which are open to mineral location in order to prospect for, appropriate, develop and process locatable minerals. Only valid existing rights may be exercised in areas withdrawn from mineral entry, such as designated wilderness areas. After withdrawal, no new mining claims may be staked. The law not only gives the right to the mineral resource, but also to the use of the surface and surface resources so long as that use is reasonable and necessary for exploration and mining activities. A list of mineral resources found on the Forest and the general current activity occuring for each is displayed in Chapter III.

The Forest Service is responsible for the management of the surface resources of National Forests, acting in cooperation with the operators to minimize the surface disturbances of mining activities. Authority to mitigate surface disturbances must not be used to unreasonably impede mining; the Forest Service is required by the 1970 Mining and Minerals Policy Act to foster and encourage private enterprise in mining and in the development of a sound mineral industry. Mitigation of impacts to other resources must meet the intent of statutes covering air and water quality standards, protection of threatened and endangered species and cultural resources.

Mineral related activities include prospecting, exploration, development and production. These activities are described below:

Prospecting involves the search for outcrops or surface exposures of mineral deposits. It also involves the preliminary exploration to test values of lodes or placers already known to exist and to determine the approximate extent of the payable ground (Thrush, 1968). The intent of prospecting is to find a target area suitable for future exploration.

Impacts to the ground from prospecting would be extremely light or nonexistent, as the methods are surficial in nature. Specific activities might include: surficial examination of accessible rock outcrops or talus slopes for evidences of minerals, large-scale reconnaissance geologic mapping, collection and analysis of hand specimens, reconnaissance stream sediment sampling at the mouths of major streams, collection of geophysical data over large areas (aeromagnetic or gravity surveys) and collection of data utilizing remote sensing techniques (multispectural scanners or side-looking radar).

Exploration is the search for ore by 1) geological surveys; 2) geophysical surveys; 3) bore holes and test pits; or 4) surface or underground headings, drifts, or tunnels. It aims at locating economic deposits and establishing their nature, shape and grade. Investigation can involve either the preliminary or final work needed to determine the size, shape, position and value of an ore body (Thrush, 1968).

Surface impacts caused by exploration vary, depending on the method used to explore, the size of the target area and funds available for the project. Exploration is a continuation of some prospecting activities, but the area of interest usually is smaller. Generally, scattered, minor surface impacts may occur during initial exploration activities because the target area is not yet clearly defined. Later activities may include an exploratory drilling program necessitating access roads, drill sites and open cutting or trenching to expose bedrock. Detailed geologic mapping, soil sampling on a closely spaced (50 to 100 feet) grid pattern for geochemical analysis and seismic, resistivity, or induced polarization surveys may also be used.

Development involves opening up an ore body by sinking shafts, driving drifts and installing requisite equipment. It prepares a proven ore body for mining and transporting ore (Thrush, 1968).

Development causes the greatest intensity of surface disturbance of all mineral and energy-related activites; however, the working area is fairly well defined and generally limited to the area of future operations. Drilling activities begun during exploration may continue through development, but the holes will be more closely spaced and most drilling can be done from existing roads. Other activities would include preparation and development of the actual operation site; construction of ore bins, stockpile areas and dump space for mine waste; improvement of road system to and within the operating area; and, possibly, preparatory work for mill construction. In most cases, this work may be done from existing roads.

Production involves mining and transporting ore from a mine to the mill or market. Little additional surface disturbance will result from production except within the mining operation area or, in the case of onsite concentration, from disposal of mill tailings. To maintain ore reserves, limited surface drilling may be continued to find new extensions of the ore body. Minor adjustment of the road systems or movement of facilities may be necessary to fit changing needs or conditions of the operation.

Any mining activity on unpatented Forest land is only a temporary use of the land and restoration is possible after mining activities cease. Reclamation activities are carefully supervised and controlled to minimize permanent surface impacts.

Short-term Use vs. Maintenance and Enhancement of Long Term Productivity- Activities associated with exploration and development of mineral resources will have the numerous effects on other resource values and uses. Although environmental effects can be minimized through existing regulations, the long-term effect will be an overall decline in the quality of the environment.

1) Much activity will be concentrated in areas that offer outstanding recreation opportunities. This will result in conflicts with recreation users. Even though visual screening, noise abatement and timing of activities will lessen conflicts, the quality of the recreation experience will decrease.

2) Continued activity will result in an increased number of roads and developed areas on the Forest. This will reduce the Forest's unroaded recreation resource. Effective transportation planning can minimize the number of miles of roads necessary. Additional roads in previously unroaded areas may benefit the development of other Forest resources, such as marginally commercial timber.

3) Surface-disturbing activities adversely affect water quality and fisheries habitat through increased bed load and suspended sediment production and increased chemical and heavy metals contamination. Establishing vegetative cover on disturbed areas, minimizing the area of disturbance, controlling erosion and runoff and containing contaminants, can minimize adverse effects on water quality and fisheries habitat. Soil characteristics will not be adversely affected if topsoil conservation and adequate design of developments avoid impacts to soil productivity.

4) Visual quality will be decreased, although screening can lessen the visual impact of developments. Although environmental effects can be minimized through existing regulations, the long-term effect will be an overall decline in the quality of the environment.

5) Activities will cause an undesirable increase in human/wildlife encounters and increased disturbance of wildlife habitat. Seasonal restrictions on activities, screening of operations and measures to minimize noise and emissions, will help mitigate these impacts.

6) Air quality may be reduced during activities, but can be mitigated through dust abatement and emissions control measures.

7) Continued activity will result in increased pressures on cultural and historical values that exist. An increased number of mitigation measures will be required to protect these properties. More old mining properties that have historic significance will be reopened. Although mitigation procedures will be followed, these areas will no longer be preserved in the same manner they are today.

8) Even though a relatively small acreage will be involved Forest-wide, the number of severely disturbed acres that can no longer be reclaimed to a condition where the imprint of man's activity is not noticeable, will increase. Well designed operations and thorough reclamation will minimize this acreage.

9) Development and production can change the social and economic structure of local communities and can result in a population influx that will put a strain on local resources. These social and economic impacts from (temporary) increases in population will be long-term effects, but are reversible. Mitigation through community planning is possible.

Activities associated with exploration, development and production of mineral resources will assist the nation's effort lessen the existing shortage of critical minerals, decrease dependence on foreign mineral imports from politically unstable countries and reduce the balance of payments deficit.

Withdrawals from mineral entry and significant access restrictions have a long-term effect on minerals discovery, development and production. Mines may require a lead time of 20 years or more from the beginning of the exploration project to the delineation of an economic mineral deposit. Several more years may be required for that deposit to be brought into production. If discoveries are impeded for a period of time through restricted access or withdrawal, a relaxation of restrictions will not have an immediate effect on production. There will be a significant delay before a production increase from new discoveries is realized. Withdrawals and significant access restrictions will result in some mineral deposits not being found or not being developed. This will increase existing and future minerals shortages, increase dependence on foreign imports and increase the nation's balance of payments deficit. This effect will be the greatest where there is significant mineral potential or high/very high geologic favorability. The amount of area exhibiting restrictions to mineral development varies by alternative, particularly by the amount of proposed roadless and wilderness classifications. These restrictions and area assignments are shown in Chapter II Table II-14.

Irreversible and Irretrievable Commitment of Resources - The removal of mineral resources is an irreversible and irretrievable commitment of the resource. A reduction in the Forest's unroaded lands (including those acres in inventoried roadless areas) will result from exploration and development. There will be some irreversible and irretrievable commitment of cultural and historical resources.

Adverse Effects Which Cannot Be Avoided - The following adverse effects (described above) cannot be avoided: surface disturbance and overall decline in the quality of the environment; disruptions to wildlife and its habitat; conflicts with other Forest users; and social and economic impacts on local communities.

Conflicts With the Objectives of Other Agencies Land Management Plans, Policies or Controls - No conflicts have been identified.

Energy Requirements - Energy would be used to explore for, develop and produce mineral resources. It also would be used by the Forest Service to monitor the surface disturbance produced by these activities. Severely restricted access for exploration would greatly increase energy consumption for this activity.

2. Common Variety Minerals

Mineral deposits outside the scope of the 1872 Mining Act because of widespread occurrence and "common" nature are disposed of under the Materials Act of 1947 (as amended). These include such resources as decorative stone, sand and gravel. The Forest Service has discretionary authority to sell these common variety mineral materials under mineral material sale permits, where extraction of these materials is compatible with other land management activities. Decorative stone is mined at several locations on the Forest with small scale operations. Sand and gravel is extracted at suitable locations where the need occurs for such activities as road construction. Differences in alternatives should have little effect on the availability of these resources.

Short-term Use vs. Maintenance and Enhancement of Long Term Productivity - Decorative stone (used for fireplaces, walls, etc.) is removed from existing talus exposures. Little to no reclamation is required to mitigate the impacts of removal. Remaining rock has less lichen cover than the rock removed from the surface of the talus exposure, which will be a long-term effect.

Gravel, riprap and a variety of road surfacing materials are removed from pits and cut slopes. The vegetation on pit sites would be destroyed. The pits would be reshaped and rehabilitated when depleted or no longer needed. The long-term productivity of the site after rehabilitation may be reduced. The visual quality will be reduced while the pit is operating. While a pit is being operated air quality may be reduced by dust generated by heavy equipment. Surfaced roads require less maintenance and allow travel over a longer season.

Irreversible and Irretrievable Commitment of Resources - The removal of common variety mineral materials is an irreversible and irretrievable commitment of resources.

Adverse Effects Which Cannot Be Avoided - Surface disturbance associated with the removal of common variety mineral materials and impacts on other resources and uses cannot be avoided, although these effects can be mitigated.

Conflicts With the Objectives of Other Agencies Land Management Plans, Policies or Controls - No conflicts have been identified.

Energy Requirements - Energy would be used to remove common variety mineral materials. It also would be used by the Forest Service to monitor mineral material sale permits. If decorative stone or road surfacing is provided in the vicinity of construction, less energy will be utilized hauling materials from other areas. Efficient travel and low maintenance on surfaced roads also will reduce energy consumption.

3. Oil and Gas

Oil and gas is specifically exempted from the 1872 Mining Act by Congress. The Mineral Lands Leasing Act of 1920 and the Mineral Leasing Act for Acquired Lands of 1947 establish a permit/lease system to authorize exploration and development of oil and gas on public domain and acquired lands. A description of the potential oil and gas resources and the current activity surrounding that potential is described in Chapter III.

This section displays impacts that occur throughout various stages in the exploration for and development of oil and gas. The stages are: leasing, geophysical prospecting, exploration drilling and field development (production). Each of these stages has its own unique impacts, which are discussed in the following sections. Even though an area is leased, there is no assurance that any of the following activities will occur on any one parcel of land. The lease gives the leaseholder or assignee the right to explore and develop, but it does not obligate him to do anything.

Alternatives that withdraw larger amounts of land from mineral leasing or restrict access to areas, will have less probability of the impacts described in the following section occurring. A description of mineral potential and access restrictions by alternative is located in Chapter II.

a. Leasing

Oil and gas related activities begin with lease applications and the issuance of leases by the BLM with the consent or recommendation of the Forest Service. The issuance of a lease does not have a direct effect on other resources, but is a commitment of resources for the term of the lease (usually 10 years). The potential effects of this commitment are controlled by attaching stipulations to the lease. Leasing grants the lessee or assignee the right to explore and develop his lease, within the terms of the lease.

Short-term Use vs. Maintenance and Enhancement of Long-term Productivity - Leasing allows a short-term opportunity to explore for and develop the non-renewable oil and gas resource. There are no direct effects of leasing on other resources, just a commitment to allow exploration and development.

Irreversible and Irretrievable Commitment of Resources - The act of leasing is considered an irreversible action for the life of the lease. The oil and gas resource is irretrievably commited to exploration and development, within the terms of the lease, for the life of the lease.

Adverse Effects Which Cannot Be Avoided - The potential adverse environmental effects that may occur as a result of oil and gas development are mitigated by lease stipulations that control on-lease activities. New lease stipulations can be added only after a lease expires, before a new lease is issued.

Conflicts With the Objectives of Other Agencies Land Management Plans, Policies or Controls - The guidelines of other land management plans are incorporated into lease stipulations. A Forest-wide Oil and Gas Leasing Process Environmental Assessment was implemented on 8/14/79. No conflicts have been identified.

Energy Requirements - Leasing does not require the use of energy unless an on-the-ground inspection of the area is needed to help determine what stipulations should be included in the lease.

b. Geophysical Prospecting

The next step in oil and gas development is geophysical prospecting, which includes seismic (shaking the earth) and non-seismic methods. Activities may take place over the same area many times and continue over a number of years. An area of interest usually is identified by preliminary seismic lines run at relatively wide spacing intervals. This spacing is narrowed as the target area becomes better defined.

The environmental effects of geophysical prospecting are discussed after various methods are listed and described.

Gravity and magnetic surveys involve taking instrument readings at fairly regular intervals or spacings. No actual surface disturbance is involved unless off-road vehicle travel is utilized to access the survey points. Some of these surveys can be done using airborne equipment which has no environmental effect. Magnetotelluric surveys are similar, but require shallow burial of some cables and recording devices by hand.

Vibroseis exploration usually is limited to existing roads and gentle terrain. Three to four large trucks travel in line and generate vibrations when large hydraulic pads mounted between the front and back wheels are lowered to the ground. Geophones (listening devices) placed along the line pick up vibrations and transmit them to a recording truck via cables.

Conventional seismic exploration involves the use of truck-mounted drills and vehicle-supported crews and generally requires off-road vehicle travel. Holes are drilled to a depth of 50-200 feet. Explosives are detonated at depth and shock waves are received and transmitted via cable and geophones to a truck-mounted recording device.

Where access limitations, topography, or other constraints prevent the use of truck mounted equipment, helicopter portable operations can be performed. Two portable techniques exist for collecting data.

1) Surface charge programs involve the simultaneous detonation of a series of individual 2.5 to 10 lb. explosive charges. The group of charges detonated together commonly totals 25 to 50 lbs. and is called a shot. Shotpoints are located at intervals along the seismic line. Surface charges can be placed directly on the ground, on snow, or on a variety of stakes or platforms above the ground. All necessary equipment to conduct the operation can be transported by helicopters and then conveyed by foot travel.

2) Various kinds of portable drills can be backpacked or delivered by helicopter to the area being explored. A deep subsurface portable program would involve drilling a pattern of approximately 16 holes up to 50 feet deep, per mile of line. At this depth 10-40 lbs. of explosives are detonated. Recording cables and geophones are laid out by foot travel.

With both of these portable techniques, shock waves generated are received and transmitted via geophones and cable to a recording device. Magnetotelluric surveys (described above) also can be conducted by helicopter. Portable methods generally are used on the Forest.

Short-term Use vs. Maintenance and Enhancement of Long-term Productivity - Although geophysical prospecting activities themselves generally do not cause significant surface disturbance, the disruption to wildlife, and other Forest users can be significant. Compaction and surface erosion caused by vehicles can be minimized by avoiding steep slopes, controlling off-road vehicle travel and controlling activities during wet seasons. Vegetative disturbance can be minimized by elevating explosive charges and controlling the locations of shotpoints in timber. Soil productivity can be maintained by reducing compaction and vegetative disturbance and by controlling the rehabilitation of drillsites and the disposal of drill cuttings. Restricting stream crossings and the use of explosives near springs, seeps and streambanks, will minimize impacts to the watershed. The effects of short-term dispersal of wildlife are minimized if activity is curtailed in big game winter ranges and calving/fawning areas during periods of big game use. Hunting quality is maintained adequately if activity is restricted the week before and during big game hunting season, for some important elk herd areas. Curtailing geophysical operations in the vicinity of active bald eagle nests and habitat during periods of conflict, will mitigate impacts on this endangered species. Conflicts with other Forest users can be minimized through scheduling of operations when necessary.

Irreversible and Irretrievable Commitment of Resources - The explosives and energy fuels consumed in conducting and monitoring seismic activities are irretrievable commitments of resources.

Adverse Effects Which Cannot Be Avoided - The explosion of seismic charges results in noise pollution, as does the use of helicopters and trucks. Increased human activity in an area results in the disturbance of wildlife, recreationists, residents and domestic livestock. Some of these effects are mitigated by controlling the time and locations and types of activities permitted.

Short-term visual impacts cannot be avoided.

There is some risk to other Forest users in the immediate area when seismic charges are detonated.

Portable methods supported by helicopters cause slower, higher cost operations. More men are in an area for a longer period of time, which may result in more disruptions to wildlife and other Forest users.

Conflicts With the Objectives of Other Agencies Land Management Plans, Policies or Controls - No conflicts have been identified.

A Forest-wide Environmental Assessment on geophysical prospecting activities was implemented on 9/2/82.

Energy Requirements - Energy is consumed during geophysical prospecting activities and during Forest Service compliance monitoring of these activities. Helicopters are not very energy efficient and often require a support team. As a result, more fuel is consumed when conventional travel is limited.

c. Exploratory Drilling

The BLM approves and supervises oil and gas operations such as drilling and production. However, through a cooperative agreement between the BLM and FS, the Forest Service provides surface resource information to the BLM for planning and administrative purposes. The Forest Service also retains administrative authority in cases involving emergency situations endangering health, safety and other resources. When a favorable site has been pinpointed, a drilling rig will be brought in (in many semi truck loads) to drill a "wildcat" well. Approximately 2-4 acres are required to set up a drilling rig complete with pumps, tanks and mud pit. Temporary access roads for transporting equipment and personnel also may be required. A surface pipeline to a stream or well, or trucks may bring water needed to mix with drilling mud, clean equipment and cool engines to the site. Energy requirements for drilling are furnished by gas or diesel-driven equipment. In remote areas, well drilling may require the construction of temporary camps for workers or helipads in lieu of all-weather roads.

Short-term Use vs. Maintenance and Enhancement of Long-term Productivity - Drilling requires many support activities and once started, continues seven days a week for twenty-four hours a day. Drilling equipment could remain onsite six months to a year or more for a deep well. Vehicle traffic to and from the site is high during construction, operation and reclamation. Depending on the placement of the rig, its visual impact can be substantial. The leveling and grading of the drill pad and necessary road construction may require the movement of a lot of earth, especially on steeper ground. Surface disturbance, human activity and noise produced by the operation, all have a serious impact on wildlife, especially in key habitat areas such as winter range. Animals could be displaced into areas of unsuitable or already occupied habitat, resulting in reduced populations. Activities of other nearby Forest users will be disrupted. If the well is not a producer and the site is reshaped and revegetated, the productive potential of the disturbed area usually will be less than adjacent undisturbed areas. If the well is a producer, the portion of the drill pad needed to produce the well can be expected to remain in place for 50 years or more.

Irreversible and Irretrievable Commitment of Resources - The energy fuels used to construct and rehabilitate drillsite facilities, drill wells and monitor these activities are irretrievable commitments of resources. Drilling additives and cement used to set casings also are irretrievable commitments of resources. Even though it will be plugged with cement if abandoned, the hole drilled is an irreversible action.

Adverse Effects Which Cannot Be Avoided - The need for building access roads, leveling the drill pad and drilling the well are all required actions in the development of an exploratory well. The ground disturbance and visual impact is an effect that cannot be avoided. Noise, increased human activity, exhausts and emmissions all are unavoidable. Some soil losses will occur due to erosion and dust dispersal. Loss of vegetative production on the disturbed area until rehabilitation is completed is unavoidable. Impacts to wildlife and conflicts with other Forest users, although they can be mitigated somewhat, cannot be avoided.

Whenever a well is drilled, there exists the possibility of penetrating a formation that contains abnormally high pressures, or hydrogen sulfide gas. Pressures could cause the well to "blow out" even though precautions are taken. If this happens and gases are blown from the well, killing surrounding vegetation. Hydrogen sulfide emissions from a well would be life threatening to people, wildlife and livestock in the immediate vicinity. The Bureau of Land Management requires contingency plans for Hydrogen Sulfide "blow outs" prior to drilling approval.

Conflicts With the Objectives of Other Agencies Land Management Plans, Policies or Controls - Although an exploratory drilling project may be started during a noncritical time of the year for wildlife, deep drilling projects could take longer than a year to complete, causing drilling to continue into a critical time for wildlife the following year. If production is established, year-round activity will occur.

Energy Requirements - Drilling a well and the associated earth moving for roads and well pads require the consumption of large amounts of fuels. Monitoring of these activities also consumes energy.

d. Field Development (Production)

If exploratory drilling results in the discovery of an oil and/or gas reservoir, field development occurs. Roads are upgraded to permanent all-weather specifications and if needed, additional space is provided to place tank batteries to store oil and water on or near the drill pad. Temporary storage tanks are used until the volume of production is known. Then liquids are trucked out at regular intervals or pipelines are installed to transport the production to refineries. If an exploratory well is productive, additional wells normally will be drilled to define the limits of the field. This would involve building additional roads, well pads and tank batteries and possibly installing additional pipelines and electrical powerlines.

Short-term Use vs. Maintenance and Enhancement of Long-term Productivity - When a well is brought into production, the area needed for production can be expected to be committed to that use for possibly 50 years or more. The area of production, drill pad and related access roads or processing plants will be out of vegetative production for a long time. There also will be short-term losses of vegetation from installation of pipelines and other facilities.

Continued occupancy of an area probably will result in a reduction of wildlife habitat capability, causing reduced wildlife populations. There will be long-term changes in patterns of use of the area being produced by livestock and recreationists. Decreases in fisheries populations are probable. Environmental effects will produce a decline in the overall quality of the environment, including air and water quality. Possible spillage of toxic materials during production activities will contribute to long-term adverse environmental effects. The reduction in visual quality of the area will be a long-term effect. Although mitigation procedures will preserve the artifacts themselves and the significance of the site where they were found, cultural resources present in the area no longer will be preserved undisturbed as they were before activity began.

The possible effect of exploration and development on other forest resources varies by alternative relative to the amount of area open for those activities and the restrictions placed on those areas. A display of the amount of area included in each restriction category is contained in Chapter II, Table II-14.

The discovery and production of oil and gas will lessen the threat of a national energy shortage occurring again soon, decrease dependence on foreign imports from politically unstable or warring countries and reduce the balance of payments deficit.

Irreversible and Irretrievable Commitment of Resources - The removal of oil, gas and other associated fluids is an irreversible and irretrievable commitment of these resources. (Salt water produced with the oil and gas may be pumped back into the production zone to help reservoir pressure).

Irreversible commitments of wildlife and fisheries populations will occur.

The overall decline in the quality of the environment, to the extent that complete reclamation is no longer possible, represents an irreversible commitment of many resources.

Reductions in the quality of the recreation (especially primitive and semi-primitive types) resource represents an irreversible commitment of this resource.

Adverse Effects Which Cannot Be Avoided - Surface disturbance, adverse effects on wildlife, fisheries, visual quality, recreation, soils, air, water and forage, can be mitigated, but not avoided.

Hydrogen sulfide gas often is a by-product of oil and gas production. It is very toxic and corrosive. This gas is flared if a pipeline isn't available to transport it to a gas plant. If the flare should malfunction, the gas would be vented into the air. In sufficient concentrations it is fatal to animals or humans that come into contact with it.

Accidental spills of other toxic materials also may occur during transportaion by truck or pipeline. Soil sterilization may result.

Conflicts With the Objectives of Other Agencies Land Management Plans, Policies or Controls - Production activities occur year-round and would be difficult to suspend even during critical periods for wildlife.

Energy Requirements - The production of oil and gas resources, while producing a great amount of energy fuels, does consume a large amount of energy. Use of pipelines for production rather than trucks is more energy efficient. Energy also would be consumed by the Forest Service in monitoring production activities.

K. Human and Community Development

A variety of programs provide employment for individuals in Forest activities. Full time Forest Service employees live and work in and near the Forest. In summer, this number is supplemented by seasonal employees; usually from local communities.

These programs have significant economic effect on the communities in and near the Forest but, of themselves, have little effect on the physical and biological environment. In some local communities, the job force of the Forest forms a significant portion of the economic base.

The level and types of employment necessary to implement Forest management activities is dependent upon the intensity and emphasis of the scheduled programs. The projected work force for each alternative is shown in Table IV-8.

Table IV-8
Forest Work Force
(Work Year Equivalents)

Alternative/Benchmark

Dec	A	B	C	D	F	G	H	Dept	I	S	Sa	W	MAX PNV	MIN LVL
1	161	158	154	153	166	161	158	161	158	155	156	167	164	128
3	163	171	167	153	166	162	159	163	158	158	159	167	169	12
5	165	171	169	156	169	167	161	165	161	158	159	169	171	12

* First decade outputs are based on planned activities. Other decade figures are projected based on continued implementation of the alternative.

Short-term Use vs. Maintenance and enhancement of Long-term Productivity - The goal of all the personnel on the Forest is to maintain the long-term productivity of the Forest.

Irreversible and Irretrievable Committment of Resources - There are no irreversible or irretrievable committment of resources identified.

Adverse Effects Which Cannot be Avoided - There are no identified adverse effects which cannot be avoided.

Conflicts With the Objectives of Other Agencies Land Management Plans, Policies or Controls - No conflicts have been identified.

Energy Requirements - Energy use by the Human and Community Development activity was not estimated because it is such a small portion of the total energy consumed on the Forest.

L. Special Uses

The Forest administers 304 special use permits authorizing the use of 4929 acres for such uses as dams, ditches, water resources, summer homes, resorts, utilities, communication devices, a ski area and 222 miles of rights-of-way. Construction, operation and maintenance of these facilities causes significant changes to the sites where they are located. Dams and ditches result in soil movement and displacement. Ditches remove water from the original channel and, if this results in low stream flow, can lower or completely eliminate the fish population. The vegetation behind the dams and in the ditch bottoms is destroyed and the vegetation along the sides of the lakes and ditches is drastically changed. The establishment of ski slopes has resulted in the removal of trees and replacement with grass and shrub cover. The special use roads have the same effect as other roads and will be discussed under the appropriate section.

Though the effects of the special uses are drastic for the specific site, these uses are limited to a small acreage of the Forest. Each request for a new permit will be subjected to environmental analysis prior to issue.

Special uses do contribute to PNV because fees are collected from permittees. These fees do not offset the administrative costs of the program. The dams and ditches contribute significantly to the economic base of the surrounding area. Irrigation of croplands is a significant use in the Beaverhead and Bighole Valleys. Much of the water used originates on the Forest and is diverted to the fields by these special use dams and ditches. Reservoirs on the Forest also provide water to Butte, Dillon and Sheridan, Montana. The lifestyle of the water users of these valleys would change drastically in absence of the water storage and distribution system.

The ski area is of local significance and the area users contribute to the local economy.

Short-term Use vs. Maintenance and Enhancement of Long-term Productivity - The vegetation on specific sites occupied by special uses is destroyed. The vegetation alongside the lakes and ditches is changed as a result of water availability. Vegetation on ski slopes is changed from tree cover to grass and shrubs. These effects will remain as long as the facilities remain on the ground.

Irreversible and Irretrievable Committment of Resource - The dams, ditches, roads and other special uses will likely be maintained into the foreseeable future. The vegetation lost by their existence constitutes an irretreivable loss of resource.

Adverse Effects Which Cannot be Avoided - Construction and maintanence of dams, ditches, roads and other facilities will cause soil disturbance and accelerated erosion. Special use facilities may not blend well into the natural landscape.

Conflicts With the Objectives of Other Agencies Land Management Plans, Policies or Controls - No conflicts are identified.

Energy Requirements - Some energy will be used by the Forest in monitoring Special Uses but this will be a minor portion of total Forest use. New dams, ditches or roads will require considerable energy use by the permittee.

M. Rights-of-Way and Cost Share

Road and trail rights-of-way are acquired by the Forest from private or other owners to provide access to Forest lands for resource development and provide trail and/or road access for recreation.

Cost share agreements are negotiated between the Forest and owners of private land inside the Forest boundary; these agreements are usually connected with timber harvest on both ownerships. Agreements cover the administration of roads and both parties share in the construction and maintenance costs. The Forest does not maintain any cost share agreements with private land owners at this time. The Forest does maintain some road maintenence agreements with local, State and Federal governmental agencies outside the Forest boundary. The environmental effects of road construction and maintenance are discussed in Section BB. The Forest is actively pursuing a program to provide access to the Forest boundary where necessary for recreation or resource managment purposes and will continue to do so under all alternatives. Providing this access will require acquisition of rights-of-way in a number of locations. Alternatives which require larger amounts of timber harvest and associated road construction, will require more activity in rights-of-way and cost share agreements above those planned.

Short-term Use vs. Maintenance and Enhancement of Long-term Productivity - Rights-of-way provide access to Forest lands necessary for resource development. Productivity can be maintained or improved. Cost share agreements allow private land owners access lands to harvest timber or other resources and reduces costs of roading to both parties.

Irreversible and Irretrievable Committment of Resources - Rights-of-way and cost share agreements can be cancelled although this is unlikely to happen in the foreseeable future. The resulting roads imply an irreversible use and the vegetation removed by the construction and maintenance constitute an irretrievable loss of a resource.

Adverse Effects Which Cannot be Avoided - Adverse effects of the resulting roads are discussed in Section BB.

Conflicts With the Objectives of Other Agencies Land Management Plans, Policies or Controls - Access to and within the Forest does not conflict with other plans in the area. Coordination with other agencies is achieved through the Interagency Travel Plan.

Energy Requirements - The only energy used in obtaining access and negotiating cost share agreements involves surveying appropriate routes.

N. Property Boundary Location

Approximately 23 miles of property boundary are located each year. The amount of boundary location is related to the amount of activity requiring the need to locate and mark ownership. The activity involves considerable manpower and time but has few environmental effects. Some vegetation may be trimmed or completely removed to establish line of sight for the survey instrument but the effect is small.

Boundary location establishes, with some finality, the property lines of Forest and other ownership. It enables the Forest and other owners to avoid activities on lands they do not own. Location of boundaries has no effect on PNV nor does it affect the economy of the area.

Alternatives which propose larger amounts of timber harvest and road construction, will require a more active boundary location program on the Forest.

Short-term Use vs. Maintenence and Enhancement of Long-term Productivity - Location of boundary has no effect on productivity.

Irreversible and Irretrievable Committment of Resources - There is no committment of resources associated strictly with boundary location.

Adverse Effects Which Cannot be Avoided - Some vegetation may be removed or pruned but the effect is small and of short duration.

Conflicts With the Objectives of Other Agencies Land Management Plans, Policies or Controls - No conflicts have been identified.

Energy Requirements - Some energy is expended in travel when surveying but this is small compared to total Forest use.

O. Land Ownership and Adjustment

Land exchange proposals are primarily initiated to consolidate ownership or to provide more efficient management of Forest lands. The Forest is currently working on several land exchanges that involve 330 acres of federal land and 267 acres of non-federal land. All private lands within or adjacent to the Forest boundary may, at some time, be subject to consideration for exchange. Each proposal will be subjected to appropriate analysis prior to final action.

Differences in land uses proposed for each alternative will generate different advantages for land ownership adjustments. Larger amounts of wilderness may initiate exchanges to obtain included private land, or larger amounts of timber harvest may initiate adjustments to avoid conflicts.

Short-term Use vs. Maintenance and Enhancement of Long-term Productivity - Lands which enter private ownership following exchange will be managed as the new owner desires. Lands obtained by the Forest Service through exchange will be managed to maintain or enhance productivity.

Irreversible and Irretrievable Commitment of Resources - Lands entering private ownership through exchange are committed to whatever the new owner desires. Lands obtained by the Forest Service will be committed to particular uses according to the land management plan in effect at the time.

Adverse Effects Which Cannot be Avoided - No adverse effects which cannot be avoided have been identified.

Conflicts With the Objectives of Other Agencies Land Management Plans, Policies or Controls - No conflicts have been identified.

Energy Requirement - Little or no energy is used in land exchange.

P. Buildings and Other Facilities

The Forest owns, leases, or maintains a number of buildings including barns, offices, work centers, garages, storage facilities and cabins. These structures occupy an insignificant portion of the total Forest acreage. Maintenance and reconstruction of administrative structures may cause short-term, localized impacts to the physical and biological environment, but the effects are insignificant on a forest-wide basis. In some locations, the presence of buildings and facilities has changed the visual quality. The facility maintenance and reconstruction program is assumed to continue at the current level under all alternatives. New buildings or structures may be necessary to replace inadequate existing facilities.

The Forest will maintain existing facilities under all alternatives.

Short-term Use vs. Maintenance and Enhancement of Long-term Productivity - Vegetative productivity will be lost during the life of the facilities.

Irreversible and Irretrievable Committment of Resources - The vegetative productivity loss represents an irretrievable committment.

Adverse Effects Which Cannot be Avoided - Although efforts have been made to landscape building sites, the presence of the facilities do affect natural appearance. Effects of soil disturbance will remain long after the facilities are gone.

Conflicts With the Objectives of Other Agencies Land Management Plans, Policies or Controls - No conflicts have been identified.

Energy Requirements - The energy required to heat and light the administrative sites are insignificant in relation to the total energy required to implement the alternatives and does not vary among the alternatives.

Q. Fire Suppression

The purpose of fire suppression is to minimize damage to valuable resources by controlling, or confining wild fires. During the 1940 to 1980 period, the Forest experienced 982 fires of which 698 were lightning caused and 284 man-caused. The average number of fire starts on the Forest in any one year is approximately 25, however, this number varies greatly from year to year depending on weather conditions.

Successful suppression has a favorable short-term effect in areas where timber management is prescribed because it protects the stands from burning. Suppression of fires in forested lands results in the establishment of old-growth forests. Old-growth dependent animals are favored and thermal cover is provided to many wildlife species. Forage is eliminated or suppressed by competition with conifers. Protection from burning leads to a high accumulation of fuels and can result in large intense fires when burning conditions are severe. Excessive heat generated by fires in dense, dry fuels consumes litter and duff which can affect productivity and soil stability. Stream sedimentation is likely to occur after a hot litter and humus consuming fire (USDA Forest Service, 1978).

Fireline construction with hand tools or heavy equipment can increase the potential for soil erosion. The potential for soil movement is increased by use of heavy equipment on steep slopes or on soils susceptible to erosion.

Fire is a natural and integral component of the forest ecosystem. The extensive lodgepole pine stands existing on the Forest were generated by natural fires in the past. The suppression and exclusion of fire from the ecosystem in areas not assigned timber management prescriptions will allow older age classes to develop and allow Douglas-fir and sagebrush to encroach into grassland vegetative communities. Older age classes are susceptible to insects and disease such as the mountain pine beetle and extensive mortality can be expected. The buildup of insects or disease may spread to adjacent commercial timber lands. As the lodgepole pine is killed, it is replaced by climax species such as Douglas-fir and sub-alpine fir. Wildlife species dependant of lodgepole pine stands will be displaced.

The fire suppression and pre-suppression program creates jobs and income for a number of seasonal employees, which adds revenue to the local economy. Alternatives vary by the amount and types of fire protection planned for the Forest. Alternatives with larger amounts of wilderness may generate more situations where natural fire is allowed to continue under contain or confine suppression strategies. More developmental alternatives would likely result in higher levels of wildfire suppression to protect resources.

Short-term Use vs. Maintenance and Enhancement of Long-term Productivity - Effective fire suppression will minimize damage to existing stands of timber. However, the long-term change in vegetative composition and density may reduce productivity and reduce wildlife habitat for some species.

Irreversible and Irretrievable Committment of Resources - Since the fire suppression program could be curtailed at any time, there is no irreversible commitment of resources.

Adverse Effects Which Cannot be Avoided - Loss of soil due to construction of firelines will occur despite preventive measures. Buildup of fuels will continue in areas protected by fire suppression.

Conflicts With the Objectives of Other Agencies Land Management Plans, Policies or Controls - No conflicts have been identified.

Energy Requirements - Energy required in the fire suppression program is dependent on the number and kind of fires. In extreme fire years, this use can be a substantial portion of the total energy expended by the Forest.

R. Prescribed Fire

Prescribed fires are fires which will be allowed to burn under observation in accordance with a predetermined set of conditions. Prescriptions for prescribed fires exist for the Anaconda-Pintler Wilderness and will be developed for the newly designated Lee Metcalf Wilderness. The same options will be available for proposed Wilderness and unroaded lands managed for semiprimitive recreation.

The environmental effect of the prescribed fire program will depend upon factors such as fuel loading, proximity to valuable resources and current weather conditions. Fires tend to increase forage for big game by removing forest canopies for tall shrubs and encourage forbs and low shrubs. Fires increase vegetative and animal diversity (Davis 1978) and increase animal species that prefer early seral stages and decrease those that prefer dense forests. In addition, accumulated fuels are consumed which will reduce the severity of future fires. Exposed soils created by fire lead to runoff which results in lower water quality for a short period of time. Fires may temporarily reduce visual and air quality.

Prescribed fire also includes fire used to reduce activity fuels following timber harvest, to accomplish site preparation prior to regeneration, or to improve range or wildlife habitat. The effects of these activities are discussed under the site preparation, range, and wildlife categories.

Alternatives which propose higher levels of timber harvest and livestock grazing will entain higher amounts of prescribed burning to reduce logging activity fuels, accomplish site preparation and to improve rangeland forage.

Short-term Use vs. Maintenance and Enhancement of Long-term Productivity - The decision to allow a fire to burn can have a long term effect on the kind of vegetation and animals occupying the area. A future generation of the overstory (trees or shrubs) may be entirely destroyed. Some of the present overstory, especially shrubs, is completely removed. A new cycle of vegetative succession is begun and allowed to continue unless interruped by fire. Animals dependent on the removed successional stage will be temporarily displaced by those dependent on earlier successional stages. The native productivity is not destroyed and, in fact, may be temporarily enhanced by the availability of the minerals in the ash.

Irreversible and Irretrievible Committment of Resources - A proposal to allow fires to burn is not irreversible. Analysis are made for ignitions to decide whether a particular fire should or should not be suppressed. If the fire is allowed to burn, the consumed material is irretrievable.

Adverse Effects Which Cannot be Avoided - The burned area will remain visible for a short time reducing visual quality and recreation opportunities in some areas. Soil is bared and water quality may be reduced for a short time by accelerated erosion. Smoke will be generated into the atmosphere.

Conflicts With the Objectives of Other Agencies Land Management Plans, Policies or Controls - Decisions to allow prescribed fire to continue will be coordinated with the State Air Quality Bureau, however fires burning for long periods of time may generate smoke which exceeds State air quality standards.

Energy Requirements - Some energy will be consumed in monitoring the planned fire. This will be a minor amount compared to the energy needed to suppress such fires and a minor portion of the total Forest use.

S. Range Management

Range management includes all activities involved with management use and protection of range resources to provide for the efficient use of the existing and potential livestock forage. These activities can have significant effects on the environment and other forest resources.

Currently, the Forest provides grazing for 190,000 AUM's located on approximately 547,000 acres of suitable range lands. While adjustments are made in permitted use within individual allotments, depending on determined carrying capacity, the total amount of permitted use on the Forest remains relatively stable. Potential livestock forage predicted for each alternative is shown in the following table. The majority of the increases shown in Table IV-9 result from transitory forage production created by timber harvest. Alternatives with larger harvest programs generally exhibit larger amounts of potential livestock forage.

Table IV-9

Average Annual Potential Livestock Forage
(thousand AUM's)

Alternative/Benchmark

DEC	A	B	C	D	F	G	H	DEP
1	190	184	182	186	192	185	192	199
3	191	205	205	186	191	188	195	202
5	201	206	210	189	202	195	209	198
10	193	185	184	184	187	188	192	201
15	197	202	202	184	187	199	193	194

DEC	Ha	I	S	Sa	W	MAX PNV	MIN LVL
1	191	178	190	189	195	180	144
3	193	182	191	191	193	196	0
5	208	189	194	193	203	201	0
10	191	180	192	191	190	182	0
15	189	190	191	190	190	196	0

* First decade outputs are based on planned activities. Other decade figures are projected based on continued implementation of the alternative.

Domestic livestock grazing is an important contributor to the economy of the Forest and local communities. Local ranchers rely on Forest lands to provide summer and winter livestock range to supplement their own lands. Increases over current grazing levels shown in the previous table mostly result from an increase in transitory range created through timber harvest. These increases will be more difficult to utilize than primary or secondary range due to the scattered nature of the available forage and conflicts with reforestation efforts. Increases in transitory forage will likely be utilized by local ranchers who currently maintain permitted use on Forest lands.

The grazing program adds to the PNV of the Forest through the collection of grazing fees. This contribution is shown in Table IV-10. Alternatives with higher amounts of permitted livestock use exhibit larger returns, and a larger contribution to the PNV of the Forest. Increases in returns from decade 1 relate directly to increases in permitted use resulting from transitory forage created through timber harvest.

Table IV-10

Range Returns in M$/yr

Alternative/Benchmark

	A	B	C	D	F	G	H	DEP
Decade 1	272	263	260	266	275	265	275	285
Decade 3	273	293	293	266	273	269	279	289
Decade 5	287	295	300	270	289	279	299	283
Decade 10	276	265	263	263	267	269	275	287
Decade 15	282	289	289	263	267	285	276	277

	HA	I	S	Sa	W	MAX PNV	MIN LVL
Decade 1	274	255	272	270	279	257	206
Decade 3	276	260	273	273	276	280	0
Decade 5	298	270	277	276	290	287	0
Decade 10	274	257	275	273	272	260	0
Decade 15	270	272	273	272	272	280	0

* First decade outputs are based on planned activities. Other decade figures are projected based on continued implementation of the alternative.

A small proportion of the permitted livestock use on the Forest is occuring without an allotment management plan (AMP). The Forest is planning to prepare AMP's for all of these areas within the next decade. When completed, all areas of the Forest will be managed using established grazing systems. These systems provide for the physiologic needs of forage plant species allowing some species to become reestablished and eventually increasing the productivity and carrying capacity of the allotment. In some cases reductions or redistributions in permitted use may be necessary to rehabilitate overused allotments. Increases in permitted use may be made in the future as increases in range conditions occur as a result of improved management systems and as range improvements are installed.

Grazing use in riparian areas along fisheries streams can have an adverse effect on the fishery habitat. Vegetation overhanging the stream channel is important for maintaining stream bank stability and preventing sedimentation into the stream channel (Boussu 1954). Grazing reduces this vegetation which can adversely change the profile of the stream channel, eliminating overhanging banks important for fish habitat and increasing the amount of sedimentation. The destruction of fish habitat reduces both the populations of fish in these streams and the number of fish available for recruitment to the downstream fisheries. Refer to Tables IV-23 and IV-7. All alternatives require protection of these riparian areas by maintaining grazing use at levels which will not severely degrade the fishery habitat. Implementation of AMP's and grazing restrictions is expected to increase existing fish populations in the first decade. These requirements may be more restrictive than current standards and could result in decreased permitted livestock use in some pastures. Achievement of these standards with minimal impacts on permitted grazing use will require installation of range improvements such as fences, water developments and cooperation with the permittee in the proper management of the allotment.

Grazing use in forested riparian areas may have adverse effects on wildlife. Livestock utilize forested riparian areas for shade, forage and water. Livestock can compact the soils and eliminate understory species. These riparian areas are also very important for many species of game and nongame species.

Conflicts with grazing can occur on big game winter ranges. The major limiting factor for elk and deer populations on the Forest is the availability of winter range forage. Intensive livestock grazing of these areas reduces the amount of forage available for wildlife. This can cause winter kill, or drive the animals onto other land ownerships, where conflicts with other uses can occur. All alternatives restrict the amount of domestic livestock use on big game winter ranges to 35 percent of the available forage. This amount ensures adequate forage is retained to provide winter forage for approximately 11,650 elk. This number of elk is not expected to cause major conflicts with livestock or adjacent land owners.

Alternatives with high grazing levels rely heavily on transitory range created through timber harvesting. The removal of the forest canopy increases sunlight which stimulates the growth of several forage species. Conflicts occur with regeneration efforts. Livestock can trample or graze on established seedlings and cause soil compaction which inhibits the germination of tree seedlings. In some cases these conflicts may require fencing to exclude livestock, or delay entry into regenerated units until seedlings are large enough to resist damage. Key wildlife areas and riparian areas adjacent to transitory range may become overutilized by domestic livestock.

Cattle grazing may annoy some recreationists because of smells, flies, visibility, noise and manure on trails and around campsites.

The proposed Continental Divide and Nee-Me-Poo National Recreation Trails traverse through existing grazing allotments. Construction of fences across or parallel to these trails will detract from the visual resoure and will require gates or stiles to allow passage by trail users.

Range improvement projects are planned in all alternatives to facilitate livestock distribution, increase forage production, provide water and to mitigate the effects of wildlife on other resources. These projects are grouped into structural and nonstructural improvements.

Structural improvements include fences, wells, spring developments, pipelines and windmills. Fencing is usually constructed around and through allotments to divide the allotments into pastures. In general, more intensive range management systems require more fencing. Fencing is also utilized to protect sensitive areas, such as riparian areas from overuse. Fencing can create a barrier to wildlife if not properly designed or constructed. The Forest currently constructs approximately 40 to 45 miles of fence per year.

Nonstructural improvements include activities such as noxious weed control, seeding of disturbed areas, ripping, furrowing, burning to remove conifer encroachment and sagebrush and fertilization. These activities are designed to increase forage. Burning, ripping and furrowing exposes the soil increasing the possibility of soil erosion, however, the sites recover quickly and the probability of significant soil loss is small. Fertilization directly increases forage production and in some cases create a more desirable species composition.

Herbicides are currently used on the Forest for spot control of noxious weeds and poisonous range plants. All current herbicide and pesticide applications are coordinated through an existing Forest environmental assessment controlling the permitte substances, applications and certified users. The Forest is currently preparing an Environmental Impact Statement covering the control of noxious weeds and poisonous range plants. Future control and possible use of herbicides will be in accordance with the EIS. Large scale projects are not now taking place or planned in the future. Any proposed for large scale application of herbicide or pesticide will entail a complete environmental assessment of effects before implementation.

The funding available for structural and nonstructural range improvements is shown in Table IV-11.

Table IV-11
Structural and Nonstructural Range Improvement Funding.
(thousands of dollars per year)

Alternative/Benchmark													
A	B	C	D	F	G	H	Ha	I	S	Sa	W	MAX PNV	MIN LVL
Range Structural Improvements													
152	147	146	149	154	148	154	154	144	152	151	156	N/A	N/A
Range Nonstructural Improvements													
74	84	72	75	82	86	90	90	77	87	87	86	N/A	N/A

Short-term Use vs. Maintenance and Enhancement of Long-term Productivity - Grazing activities can increase the long-term productivity of forage on the Forest. As allotments come under allotment management plans and structural and nonstructural improvements are implemented, an increase in production should be realized. Intensive management of pastures containing fisheries streams will increase fish production from current levels. Some small areas surrounding salting and watering areas may be compacted and a decrease in vegetation occur.

Irreversible and Irretrievable Committment of Resources - There is a long tradition of grazing livestock on the Forest. As long as this tradition exists, there is little likelihood that all livestock will be removed from the Forest. The forage grazed by these livestock is a committment of that resource.

Adverse Effects Which Cannot be Avoided - Some minor conflicts may continue to exist between livestock and big game. This is especially true of elk, since elk and livestock forage on many of the same species much of the year. Key wildlife habitat and riparian areas adjacent to transitory forage may become overused by domestic livestock. Fencing for livestock use may create a barrier or danger to wildlife. Facilities (fences and water developments) on rangelands will affect the visual resource. Recreationists will continue to be annoyed by smells, flies, sounds and manure in some areas. Compaction and vegetation change will continue to occur in heavily used areas. Fish habitat and water quality will be adversely affected.

Conflicts With the Objectives of Other Agencies Land Management Plans, Policies or Controls - No conflicts have been identified.

Energy Requirements - Energy required by the Forest in livestock management is not great. Some may be required in monitoring the resource, maintenance of facilities and the construction or implementation of structural and nonstructural range improvements. This will not be a significant portion of the total used on the Forest. Permittees will also use energy in managing livestock while on the Forest and in moving livestock to and from Forest rangelands. The energy used under intensive management systems is expected to be greater in most cases than that used in current management.

T. Utility Transportation Corridors

For this discussion, utility corridors are linear strips of land which contain existing power transmission lines or have been identified as having potential for future locations of utilities.

An analysis has been made to define the kinds of land which should be avoided in permitting or construction of linear right-of-way utility lines, oil and gas pipelines and communication lines. The analysis is based on information contained in the Pacific Northwest Long Range East-West Energy Corridor Study, Phase 1 (Draft), Part A-Rocky Mountains, Part B-Cascade Mountains, Bonneville Power Administration, December, 1977. This analysis inventoried existing facilities and potential corridor locations. Guidance for the analysis is contained in a Region 1 letter to the Forests on Corridor Planning Guidance, 1990 Special plans and Studies dated October 7, 1982. Avoidance areas are defined as areas where establishment and use conflict with land use/land management objectives. Exclusion areas are defined as areas where such facilities are not allowed. Windows are critical transmission corridor crossing points (usually topographically constrained).

Presently there are four occupied transmission corridors on the Forest. These corridors are located at Lemhi Pass, Bannack Pass, Big Hole Pass and the Shepherd Mountain area. These corridors do not conflict with wilderness or other management proposals in any of the alternatives.

As cited in the BPA study, there are four unoccupied potential transmission corridors located on the Forest. Wilderness designations would preclude the development of these corridors. If wilderness designations precluded development of corridors, alternative routes would need to be considered. These routes would likely entail longer distances than those proposed through the identified route. Longer distances increase construction costs, increase energy costs to the consumer and would impact other resources over a larger area. Table IV-12 lists the unoccupied corridors and the alternatives which contain wilderness designations precluding development.

Table IV-12

BPA Corridor	Inventoried Roadless Area	Alternatives Designated Wilderness
R-29	Beaver Lake (1-003)	I
R-35	Sheep Mtn. (1-021)	C, I
	Crockett Lake (1-022)	C, I
	Cherry Lakes (1-023)	C, I
R-36	Black Butte (1-026)	C, I
	Bighorn Mtn (1-027)	C, D, I
	Freezeout Mtn. (1-029)	C, D, I
R-37	Freezeout Mtn. (1-029)	C, D, I

R-29 begins approximately 10 miles west of Wisdom and follows Trail Creek westward through Gibbons Pass. Much of the corridor is timbered with some livestock use on the periphery of the timbered land. This corridor would cross 3 to 5 miles of Roadless Area 1-003.

R-35 starts approximately 18 mile south of Ennis, Mt. and proceeds west across the Gravelly Range over an 8,000 foot pass to the Ruby River. The Forest portion of the corridor is comprised mainly of rangeland. This segment crosses Roadless Areas 1-021, 1-022 and 1-023.

R-36 begins approximately 30 miles south of Ennis near Highway 287 on the Madison River. The route heads west up Standard Creek towards the ridgeline which forms the Gravelly Range. The segment would pass north or south of Black Butte and proceed west towards the Ruby River. Livestock grazing is the primary land use for the area. This corridor could cross up to 11 miles of Roadless Areas 1-026, 1-027, or 1-029.

R-37 begins near Wade Lake and the Madison River and proceeds up the West Fork of the Madison River, through a pass (7,000 foot elevation) and continues to the Red Rock Lakes Basin. This segment is comprised of mainly rangeland. The Red Rock Lakes National Wildlife Refuge is on the southern end of the corridor segment. This refuge is charged with the management of the Trumpeter swan and is important for other wildlife species.

An additional corridor (R-32) was shown for the 1-549 Roadless Area. With the passage of the Lee Metcalf Wilderness Management Act of 1983, this area was designated as wilderness and is now precluded from development.

Only when corridors are occupied does the impact occur. Prior to construction of a utility line or oil and gas pipeline, an appropriate analysis would be required to establish the final location of the facility and its supporting road. At this time, the effects of the facilities would be displayed.

Short-term Use vs. Maintenance and Enhancement of Long-term Productivity - The existence of an unoccupied corridor has no effect on long-term productivity.

Irreversible and Irretrievable Committment of Resources - The identification of the corridor is not an irreversible or irretrievable committment of resources. However, as long as the corridor does not cross identified exclusion areas, the possibility of occupation by a utility does exist.

Adverse Effects Which Cannot be Avoided - Until occupation occurs, no conflicts are expected.

Conflicts With the Objectives of Other Agencies Land Management Plans, Policies or Controls - No conflicts have been identified.

Energy Requirements - None while the corridor is unoccupied.

U. Insects and Disease

Mountain pine beetle infestations in mature and overmature stands of lodgepole pine is the most serious problem on the Forest. An epidemic centered in the Gravelly Planning Unit has caused major amounts of mortality of lodgepole pine in the past twenty to twenty-five years. Other areas of the Forest such as the Big Hole drainage are moderately to highly susceptible to future epidemics.

Lesser damage occurs Forest-wide from western spruce budworm in the Douglas-fir, dwarf mistletoe in lodgepole pine and other insects and disease.

The most effective means to conduct a meaningful integrated pest management program on the Forest is by vegetative manipulation through timber harvest. This may involve harvest systems such as clearcutting to create conditions unfavorable to the particular pest being managed. The program may also involve controlling the species composition of stands by planting nonhost species or removing susceptible species when thinning. (Amman and others, 1977). The effects of these management practices are discussed in sections dealing with thinning and regeneration.

The use of chemical and biologic pesticide can be effective for controlling some insects such as western spruce budworm and for reducing competing grass and brush species in regeneration units. The Forest currently has no plans for the use of these pesticides. Proposals for use of pesticides or herbicides would be subjected to a complete environmental analysis prior to implementation.

Insect and disease control has the potential for affecting the local economy. If large infestations occur and controls are not applied, timber available to the local markets can be greatly reduced over the long-term.

Silvicultural treatment presents the most effective method of controlling and managing forest insects and disease. Alternatives which schedule timber harvest on a greater amount of acres provide a greater opportunity for treatment of infestations.

Short-term Use vs. Maintenance and Enhancement of Long-term Productivity - The application of appropriate silvicultural methods to control insects and disease increases the long-term productivity of the Forest from the standpoint of recoverable resources.

Irreversible and Irretrievable Committment of Resources - The only control measure proposed by the Forest at this time involves silvicultural means. Unharvested timber killed by insects because of lack of control represent an irretrievable loss of that resource.

Adverse Effects Which Cannot be Avoided - Silvicultural attempts to control insects may result in harvest of trees in areas which affect visual quality and may also result in larger than preferred cutting units. In some cases, the forty acre limit for harvest unit size specified in the Regional Guide may be exceeded. Proposals for exceeding the forty acre limit for harvest unit size will be reviewed and analyzed in accordance with the direction in the Regional Guide. Harvesting to contain or control insects or disease may entail practices which are not ideal for wildlife management in the short run.

Conflicts With the Objectives of Other Agencies Land Management Plans, Policies or Controls - No conflicts have been identified.

Energy Requirements - The proposed pest management activities require no energy above that used in the normal timber sale program. Should a proposal be made to use pesticides, considerable energy would be required, however, this would be disclosed in the appropriate analysis document.

V. Timber Harvest

Timber management consists of a series of activities which are prescribed to regulate the growing, tending, harvesting and regeneration of wood crops on suitable timber sites. Timber harvest is only one step in the overall process of timber management (Smith, 1962, Daniels, 1979)

The Forest harvests timber from areas identified as being suitable for long term timber management. The amount of suitable acreage and the volume of timber harvested per acre of suitable timber acres varies by alternative due to the different emphasis on management for other resources.

The long-term sustained yield in cubic feet and board feet and the amount of acres in the suitable timber base for each alternative is displayed in Table IV-13.

Table IV-13

	Alternatives/Benchmarks														
Resource	A	B	C	D	F	G	H	HA	DEPT	I	S	Sa	W	MAX PNV	MIN LVL
Long Term Sustained Timber Yield (MMBF)	31.3	49.2	42.3	18.6	35.3	41.2	33.3	37.1	40.2	25.7	32.1	34.5	35.7	51.9	0
Long Term Sustained Timber Yield (MMCF	10.8	16.4	14.1	6.0	11.4	13.3	10.4	11.6	13.4	8.3	9.3	9.8	11.5	17.3	0
Suitable Timber (Acres)	535	653	537	313	609	548	379	434	379	347	338	360	616	731	0

a First decade outputs are based on planned activities. Other decade figures are projected based on continued implementation of the alternative.

There is a direct relationship between the suitable acres and amount of proposed timber harvest in each alternative. Alternatives with largest acreages of suitable timber have the potential to provide the most beneficial effect on the timber resource. These benefits include:

A. Improved age and size class distribution.
B. Maintenence of healthy, vigorous stands.
C. Reduced threat of insect, disease and wildfire.
D. Better utilization of growth potential of timber growing sites.
E. Production of higher levels of timber now and in the future.

Forest diversity is an important factor in maintaining healthy wildlife populations and reducing the threat to the forest from insects, disease and fire. Currently the forest has a large portion of acreage in mature and overmature age classes. As the suitable timber lands are harvested and regenerated, the relative proportion of age and size classes will become more even. The acreage of each age and size class expected to occur over time on the Forest for each alternative is shown in Table IV-14.

The 1980 revised statement of policy requires a comparison of the long term sustained yield for timber with the projected growth rate at year 2035 for the proposed action. The long-term sustained yield (LTSY) for alternative S (Proposed Action) is 9.31 MMCF/year. The projected growth rate at year 2035 is 4.99 MMCF/yr. indicating that the Forest would achieve 54 percent of potential growth by the fifth decade if managed under alternative S.

Table IV-14

Forest Condition Class Acreage by Alternative (Thousands of Acres)

	Decade	Grass-Forb	Shrub-Seed	Pole-Sapling	Young	Mature	Old Growth	Total
Alt. A	1	1004.8	149.6	40.4	141.9	566.4	244.0	2,147.0
	5	1004.8	228.2	109.4	0.0	172.9	631.7	2,147.0
	10	1004.8	239.5	227.3	101.0	8.4	566.1	2,147.0
	15	1004.7	223.1	253.1	138.7	34.2	493.2	2,147.0
Alt. B	1	1004.8	149.6	40.4	141.9	566.4	244.0	2,147.0
	5	1004.8	297.1	124.3	0.0	157.6	563.3	2,147.0
	10	1004.8	281.9	333.5	115.8	4.9	406.2	2,147.0
	15	1004.8	267.1	292.5	162.4	15.5	404.8	2,147.0
Alt. C	1	1004.8	149.6	40.4	141.9	566.4	244.0	2,147.0
	5	1004.8	280.4	103.6	0.0	162.9	595.4	2,147.0
	10	1004.8	264.4	283.3	95.2	2.4	497.0	2,147.0
	15	1004.8	255.5	257.8	125.1	4.6	499.4	2,147.0
Alt. D	1	1004.8	149.6	40.4	141.9	566.4	244.0	2,147.0
	5	1004.8	176.8	65.2	0.0	180.5	719.8	2,147.0
	10	1004.8	188.4	106.8	56.7	8.4	782.0	2,147.0
	15	1004.8	193.8	120.0	67.6	39.7	721.2	2,147.0
Alt. F	1	1004.8	149.6	40.4	101.6	606.7	244.0	2,147.0
	5	1004.8	216.6	115.7	0.0	179.2	630.8	2,147.0
	10	1004.8	249.4	223.8	107.2	8.4	553.5	2,147.0
	15	1004.8	244.8	232.3	145.6	79.0	440.6	2,147.0
Alt. G	1	1004.8	149.6	40.4	141.9	566.4	244.0	2,147.0
	5	1004.8	240.2	127.4	0.0	173.1	601.6	2,147.0
	10	1004.8	256.1	256.7	118.9	1.9	508.7	2,147.0
	15	1004.8	228.8	242.1	149.2	11.6	510.6	2,147.0
Alt. H	1	1004.8	149.6	40.4	141.9	566.4	244.0	2,147.0
	5	1004.8	222.5	96.9	0.0	173.9	649.0	2,147.0
	10	1004.8	186.4	212.7	88.5	6.7	648.0	2,147.0
	15	1004.8	177.5	131.0	127.0	54.6	652.2	2,147.0
DEPT	1	1004.8	149.6	40.4	141.9	566.4	244.0	2,147.0
	5	1004.8	247.3	133.5	4.0	161.8	595.7	2,147.0
	10	1004.8	153.7	211.3	125.1	4.1	648.1	2,147.0
	15	1004.8	224.1	154.5	91.5	20.0	652.2	2,147.0
Alt. HA	1	1004.8	149.6	40.4	141.9	566.4	244.0	2,147.0
	5	1004.8	233.0	110.8	0.0	173.3	625.2	2,147.0
	10	1004.8	194.3	236.9	102.4	4.1	604.6	2,147.0
	15	1004.8	184.1	153.5	140.9	55.2	608.6	2,147.0

Table IV-14 Continued

Forest Condition Class Acreage by Alternative (Thousands of Acres)

	Decade	Grass-Forb	Shrub-Seed	Pole-Sapling	Young	Mature	Old Growth	Total
Alt. I	1	892.0	184.6	41.3	146.1	598.2	284.8	2,147.0
	5	892.0	241.2	76.5	0.0	184.5	753.6	2,147.0
	10	892.0	255.0	166.5	68.0	2.5	763.0	2,147.0
	15	892.0	231.3	152.8	101.4	4.1	765.5	2,147.0
Alt. S	1	1000.2	151.9	40.4	141.8	566.4	246.3	2,147.0
	10	1000.2	205.9	77.8	0.0	165.2	698.0	2,147.0
	10	1000.2	196.3	180.3	69.4	6.7	693.6	2,147.0
	15	1000.2	193.9	130.2	99.4	32.3	691.2	2,147.0
Alt. Sa	1	1004.7	149.6	40.4	141.9	566.4	244.0	2,147.0
	5	1004.7	207.1	81.5	0.0	163.3	690.3	2,147.0
	10	1004.7	197.5	190.1	73.1	6.7	674.8	2,147.0
	15	1004.7	191.0	136.9	108.8	33.0	672.6	2,147.0
Alt. W	1	1004.8	149.6	40.4	141.9	566.4	244.0	2,147.0
	5	1004.8	217.7	117.4	0.0	178.6	628.6	2,147.0
	10	1004.8	250.8	224.7	109.0	8.4	549.4	2,147.0
	15	1004.8	247.3	236.7	145.3	79.4	433.6	2,147.0
MAX PNV	1	892.0	184.6	41.3	146.1	598.2	284.8	2,147.0
	5	892.0	311.4	154.1	0.0	176.8	612.8	2,147.0
	10	892.0	335.3	350.6	145.6	1.9	421.6	2,147.0
	15	892.0	291.4	321.7	212.1	6.4	423.4	2,147.0
MIN LEVEL	1	772.2	185.9	39.6	146.7	597.7	404.9	2,147.0
	5	772.2	170.3	15.5	0.0	186.3	1,002.7	2,147.0
	10	772.2	170.3	0.0	6.4	9.1	1,189.0	2,147.0
	15	772.2	170.3	0.0	0.0	6.4	1,198.1	2,147.0

* First decade outputs are based on planned activities. Other decade figures are projected based on continued implementation of the alternative.

Growth does not meet 90 percent of LTSY until approximately 2050. Due to the predominance of mature and overmature lodgepole pine on the Forest, the current growth is less than 10 percent of LTSY. Increases in growth occur as mature and overmature stands are regenerated. Meeting 90 percent of LTSY by the year 2035 would require harvesting above LTSY in the early decades and would constitute a departure.

The harvest of timber is important to the economic base of the area. Mills in the vicinity are dependent on the timber harvested from the Forest.

A large portion of the revenues received by the Forest are generated through timber harvest. These revenues contribute a significant amount to the total present net value (PNV) of management activities. The contribution to PNV is dependant upon the amount of timber harvest, the intensity of the selected prescriptions, as well as the market value of the timber resource. Alternatives which place constraints on timber management for mitigating the effect on other resources reduce the proportion of harvest revenues contributing to PNV.

Alternatives H, Ha and the departure contain a constraint to harvest mostly lodgepole pine in the first four decades. This constraint was applied to model the Forest's efforts to control probable mortality from mountain pine beetle. Alternatives S and Sa contain constraints which limit the amount of harvest in mixed conifer types in the early decades. This has the effect of concentrating the majority of the harvest in lodgepole pine types much as the constraint applied to alternatives H and Ha. The remainder of the alternatives did not contain these constraints and harvest a higher proportional amount of the mixed conifer types in the early decades. The early harvest of the mixed conifer stands increases PNV due to the higher value associated with Douglas-fir and the greater board foot/cubic foot ratio.

If an alternative was implemented without an emphasis on the harvest of lodgepole pine, a high risk of significant mortality due to the mountain pine bettle would be present. If an epidemic occurred, the realized PNV for that alternative would be much lower than displayed.

Constraints were also placed on some alternatives to protect key wildlife habitat. A discussion of these constraints and the effect on timber harvest is shown in the wildlife section.

Two general categories of silvicultural systems are associated with timber management; even-aged and uneven-aged. Both systems are proposed for use and each have separate and distinct effects discussed below.

1. Even-aged management of timber - This system of management produces stands of timber composed of one or two structural components. The trees within each component are relatively the same age. Three major silvicultural harvest methods are used to create and manage for even-aged stands; Clearcutting, Shelterwood and Seedtree. (Burns 1983)

Clearcutting is the harvesting in one cut of all trees on an area for the purpose of creating a new, even-aged stand.

Shelterwood harvest removes the mature stand in a series of one or two cuts. Regeneration of the new stand occurs under the cover of a partial forest canopy or shelterwood. A final harvest cut removes the shelterwood and permits the new stand to develop in the open as an even-aged stand. This system provides a continuing cover of either large or small trees. It is especially adapted to species or sites where shelter is needed for the new reproduction, or where the shelterwood gives the desired regeneration an advantage over undesired competing vegetation. Residual shelterwood trees are generally removed from the site within 10 to 20 years following the establishment of the new stand. (Burns 1983)

Seedtree harvest involves harvesting nearly all the timber on a selected area in one cut. A few of the better trees of the desired species are left well distributed over the area to reseed naturally. When feasible, the seed trees are harvested after regeneration is established.

Each of the available even-aged silvicultural harvest methods may be used to manage the major timber types found on the Forest.

a. Lodgepole Pine Cover Types

Clearcutting is used extensively in lodgepole pine stands. Lodgepole pine is extremenly intolerant to shade. Hormonal responses to shaded sunlight restricts seed germination and root development in seedlings. In areas where regeneration of lodgepole pine is the objective, clearcutting or at least very open stand conditions are necessary allow for seed germination and to obtain maximum growth of regeneration after becoming established.

Shelterwood harvest in lodgepole pine may be used when continuous site occupancy with trees is desirable for other resource reasons; however less growth can be expected due to the shading of regeneration (Wycoff, Crookston, Stage).

Seedtree harvest may be used in lodgepole pine types when broadcast burned to remove logging slash. This method of harvest is a one time attempt to achieve natural regeneration as the residual seed trees are generally killed by the fire.

b. Douglas-fir Cover Types

Clearcutting is used on moister Douglas-fir types where low soil moisture is not a barrier to regeneration. On these sites shelter trees are not needed to protect regeneration. Clearcutting is used to maximize growth of the regenerated stand by producing full sunlight conditions. (Wykoff, Crookston, Stage, 1982).

Shelterwood harvests are used extensively on the drier mixed conifer sites where Douglas-fir is the desired regenerated species. Douglas-fir is more shade tolerant than lodgepole pine and in many drier sites requires the retention of a residual overstory to protect regenerated sites from excessive moisture depletion. On some sites, however, sufficient suitable shelter trees may not be present in the stand. Available shelter trees may contain heavy infections of dwarf-mistletoe, spruce budworm, or may be genetically undesirable. In these cases clearcutting may be used with subsequent artificial regeneration to create a superior new stand of healthy trees.

Seedtree cutting may be used on moister Douglas-fir sites where the retention of shelterwood trees is not needed to protect regeneration and where sufficient desirable seed trees are present. This method, like clearcutting, provides for maximum growth of regeneration by providing full sunlight conditions.

c. Spruce/Sub-alpine fir

Clearcut harvest provides the best opportunity to manage these sites for timber production. Although generally shade tolerant, regenerated stands exhibit maximum growth under full sunlight conditions.

Shelterwood harvest systems may be used on these sites where continuous site occupancy with trees is desirable to maintain or enhance other resource values. Retention of shelterwood trees is generally not necessary to protect or assure the regenerated stand. Due to the fragility of soils commonly found on these sites and the susceptibility of residual trees to logging damage, the protection of the shelterwood trees is difficult.

Seedtree harvest can be used on these types to provide seed for natural regeneration and where sufficient, desirable seedtrees are present. The effects and results are similar to those of clearcutting.

The three systems of evenaged management have potential for environmental effects. All large trees are removed from the area in a short period of time, openings are created and soil is exposed to erosion (Bethlahmy, 1967; Megahan and Kidd, 1972). The shape and size of units and the logging methods used become important factors in mitigating these effects. The percentage of total timber harvest in the early decades to be cut by all planned silvicultural systems is shown in Table IV-15.

Table IV-15

Timber Harvested in the Decade 1 by Clearcutting, Shelterwood, and Selection (Percent of total)

	Alternative/Benchmark														
	A	B	C	D	F	G	H	DEPT	HA	I	S	Sa	W	MAX PNV	MIN LVL
Clearcut	51	100	98	53	58	91	84	93	83	100	84	84	56	100	0
Shelterwood	49	0	0	47	42	9	16	6	17	0	16	16	44	0	0
Selection	0	0	2	0	0	0	0	1	0	0	0	0	0	0	0

Because even-aged harvest management will be the major system used on the Forest in the first decades, those activities and associated road construction have the most significant effect on visual quality. Although the impacts of timber management are relatively short lived, the immediate change to the existing landscape is undesirable to many Forest users. The establishment of visual quality objectives provides the method for carrying out timber management while protecting the visual resource. Treatments will be spaced and timed so adverse impacts are minimized.

As trees are removed, evapo-transpiration is reduced and more water is infiltrated in to the groundwater system. This is emphasized when even-aged harvest systems are used because the entire mature forest canopy is removed. In extreme cases, this can lead to mass failure, the slipping of large areas of soil and rock on steep slopes and clay soils (Dryness, 1967; Fredrickson, 1970). Mass failure hazards are generally low on the Forest and potential problems will be analyzed by the appropriate specialists and dealt with on a case-by-case basis. Best management practices will be employed to mitigate potential impacts.

The increase in infiltration and the tendancy for openings to accumulate snow results in increased water yield which generally occurs at the time of peak flow. The water regime for an area harvested by an even-aged management system will generally recover to preharvest conditions about 20 years after harvest (Garn, 1973). This increased flow can be of benefit to farmers who irrigate downstream, providing storage capacity (dams) that exist to capture the increased flow. Increasing the flow at peak times also can affect the stability of the stream banks resulting in some erosion. A cummulative effects analysis will be made prior to ground disturbing activities to estimate effects and assure impacts remain within acceptable limits.

Even-aged management generally provides the best opportunity to maximize timber growth. Maintenance of a single stand component reduces general competition for sunlight and prevents supression of smaller size classes. Cultural treatments such as precommercial thinning to maintain optimum spacing and species control are most effectively and efficiently accomplished with these systems.

Even-aged harvest systems provide the best opportunity for control of insects and disease because all diseased or susceptible trees are removed and a young, vigorous stand is initiated. In many cases, clearcutting is the only system which provides this control. In situations where shade is necessary for seedling survival but the overstory is infected with either dwarf-mistletoe or spruce budworm, a shelterwood harvest is appropriate if the remaining overstory is removed before the regeneration is heavily infected. Infected regeneration can then be removed during thinning operations.

Even-aged harvest systems provide the best opportunity for reduction of fire hazard. In clearcuts, there are no living trees to be protected during slash disposal. Slash and other fuel reduction in shelterwood harvests is more difficult and costly because the standing trees must be protected.

More forage is produced through clearcutting than through other silvicultural systems (Planning Records). Less forage is produced in the shelterwood system and the forage response is shorter because trees occupy more of the site for more time. Forage produced under a partial canopy seems to be less palatable than that produced in full light. Transitory range for cattle is created when harvest occurs on allotments. Cattle and big game use the forage produced and competition for forage could be a problem on some big game winter range areas.

Even-aged management generally provides for the greatest economic efficiency of timber management. Using the clearcut system, stands are entered for harvest only once during the rotation period. Shelterwood and seedtree systems require two entries to remove the overstory but fuel treatment and site preparation are required only once.

Even-aged harvest results in reduction of big-game cover, increasing the probability of animals being harvested during hunting season. However, diversity is increased, when openings are created in dense canopies, providing habitat for other wildlife species. Wildlife species which prefer openings or sparse canopies will find more suitable habitat and those species preferring dense canopy or old-growth trees will find less. Edges are created for those species which rest or hide in dense canopies and feed in the openings.

Even-aged harvest will be the major method of converting old growth stands to younger age classes. At least six percent of the suitable timber lands will be retained in old-growth forest in the next hundred years. All forested lands not suitable for timber production and all forested wilderness have the potential to produce old-growth stands unless catastrophic fire, insects or diseases kill the trees. Alternatives which retain more area in undeveloped status will maintain larger amounts of old-growth habitat Forest-wide.

Table IV-16
Percent of Suitable Timberland Providing Oldgrowth Habitat in the Year 2080*

Alternative/Benchmark														
A	B	C	D	F	G	H	DEPT	HA	I	S	Sa	W	MAX PNV	MIN LVL
19	8	6	30	26	9	9	7	11	10	8	9	26	10	0

* Figures are projected based on continued implementation of alternatives.

Timber productivity in the future is enhanced by proper application of any silvicultural system. Old, slow growing trees are replaced by young, faster growing trees and the growth rate can be sustained by thinning, weeding and commercial thinning.

Clearcutting is the least costly method of harvesting trees because high volumes are removed in small areas. Shelterwood harvest is more costly because a second harvest of the remaining overstory is required. Costs vary by tree species harvested, land slope, yarding distance and other factors but the removal of all trees from a site is cheaper per unit volume than removal of only a portion of the overstory. These lesser costs include the fact that clearcut units are easier to lay out and mark and subsequent fuel reduction methods need not protect residual trees.

Activities such as harvest and road building do not eliminate existing recreation settings, but they are changed. Hunting can occur in all settings, but the type of experience is changed. Changes in recreation setting will displace some forest visitors seeking undeveloped areas. As the recreational settings shift towards development, changes in the types of dispersed recreation experiences and settings will result. The impacts to recreation are partially mitigated by maintaining visual quality in developed sites and dispersed recreation settings. In all alternatives, existing and proposed National Recreation Trails will be protected from incompatible timber management activities. These trails are classed as visual sensitivity level one viewing areas, resulting in a Visual Quality Objective of retention in the foreground viewing area. Even-aged management can adversely affect the recreation experience by disrupting Forest trail systems or creating undesirable openings. The experience may be occasionally enhanced to some extent by careful placement of openings to create scenic vistas. Where harvest units are placed across or adjacent to trails, the tread will be retained or relocated.

Short-term Use vs. Maintenance and Enhancement of Long-term Productivity - Even-aged management provides the best opportunity for improving long-term productivity. Growth of regenerated stands is maximized, insects and disease are effectively controlled and cultural treatments such as precommercial thinning are most effectively and efficiently accomplished. Young vigorously growing trees replace slow growing old trees. Fire hazards are reduced and a more desirable mix of tree species can be introduced. However, with these systems, it is more difficult to maintain visual quality. Some soil is lost and peak flows of water are increased, increasing the chance of damage to stream channels. Habitat for wildlife species which prefer closed canopies is reduced but habitat for those species preferring openings is increased.

Irreversible and Irretrievable Committment of Resources - Although areas which have been harvested by even-aged systems may not be available in the future, the road system necessary for harvest has been constructed and considerable money has been expended in regeneration. For all practical purposes, most areas previously harvested are irreversibly committed to timber harvest in the future. The wildlife habitat changed by the harvest and the dispersed recreation opportunities lost or drastically changed are irretrievable. Roading and development of roadless areas for timber management changes those characteristics which qualifies them for roadless status and from wilderness consideration in the future.

Adverse Effects Which Cannot be Avoided - Visual quality may be lowered by even-aged management within assigned visual quality objectives. Some soil will be eroded and water quality will be lowered in affected drainages but will remain within acceptable limits as described in the Forest Plan Standards. Wildlife habitat will decrease for species preferring dense canopies or if elk security cover is limited. Fish habitat will be changed by harvest occurring in riparian areas or by increased sedimentation. Primitive and semiprimitive recreation opportunities will be diminished.

Conflicts With the Objectives of Other Agencies Land Management Plans, Policies or Controls - Timber harvest and associated road construction in some areas may conflict with the goals and objectives of the Montana Department of Fish Wildlife and Parks when access into an area is likely to create increased hunting pressure or a decrease in available wildlife habitat.

Energy Requirements - Since most of the timber on the Forest will be harvested by even-aged management, most of the energy required will be directly associated with these systems. The total energy requirements for harvest operations is shown in Table IV-17.

Table IV-17
Energy Consumption Related to Timber Harvest
(Million B.T.U.'s)

	Alternative/Benchmark							
	A	B	C	D	F	G	H	DEPT
Timber Harvest	24	28	21	16	30	36	17	26
Stand Exam	3	26	27	20	16	36	17	17
Reforestation	5.6	6.0	6.5	6.2	3.1	5.9	3.7	5.7

	Ha	S	Sa	I	W	MAX PNV	MIN LVL
Timber Harvest	19	14	15	23	31	46	0
Stand Exam	17	17	17	20	16	20	0
Reforestation	6.7	4.7	4.8	1.6	2.9	3.3	0

* First decade outputs are based on planned activities. Other decade figures are projected based on continued implementation of the alternative.

2. Uneven-aged Management of Timber - Uneven-aged silvicultural systems produce stands of timber which contain a variety of age classes from mature to seedling sized trees. The two major harvest methods used to create uneven-aged stands is selection and group selection.

Selection timber harvest removes individual trees from a stand. Harvested trees are generally mature, over-mature or undesirable. Younger trees are retained to continue growth until reaching harvest characteristics.

Group selection involves the removal of small groups of trees from a stand. These groups typically comprise one quarter to three acres in size and may range up to five acres in some instances. The objective of this method is to create a mosaic of age classes across the stand over time (Burns 1983).

Each of these systems may be appropriate for use under some physical conditions and to protect resource values.

a. Lodgepole Pine Cover Types

Selection and group selection systems may be used in lodgepole pine cover types where conversion to more shade tolerant species is a desirable result. Due to the intolerance of lodgepole pine to shaded conditions, regeneration of lodgepole pine using the selection system is not obtainable. Group selection harvest increases the possibility of obtaining at least a portion of the regeneration as lodgepole pine.

b. Douglas-fir Cover Types

Selection and group selection systems may be used in Douglas-fir cover types where continuous site occupancy with trees is necessary to protect other resource values. On some drier sites where removal of a majority of the overstory would cause excessive drying of a site, these systems may be the most desirable method of producing a continuous supply of timber products.

c. Spruce/Sub-alpine fir Cover Types

Selection and group selection systems may be used in these types where continuous site occupancy with trees is desired to maintain other resource values. Due to common fragility of soils in these types and the susceptibility of the species to logging damage, this type of harvest in these types must be accomplished with extreme care to protect the residual trees.

d. Riparian

Due to the high importance of riparian areas for resource values such as watershed, fisheries and wildlife habitat, selection and group selection systems are used extensively in these areas. In areas where retention of shade intolerant species such as lodgepole pine is desirable, group selection provides conditions suitable to at least a portion of the regeneration of those species occurring.

Water quality and quantity are not greatly affected by these systems because the canopy is not altered significantly, soils are not unduly disturbed and the remaining trees are able to respire the extra water. In all alternatives, uneven-aged management will be prescribed in timbered riparian zones. Large trees will be left to protect the streambanks, provide shade and eventually fall into the stream improving fishery habitat by forming pools and riffles (Frear, 1982). The amount of uneven aged harvest is shown in Table IV-15.

Fire and slash disposal are difficult to manage in uneven-aged systems. Selection harvest leaves little opportunity to dispose of natural fuel loads or those generated by harvest, because few openings large enough to allow piling and burning are present. Openings created by group selection harvest generally require expensive hand piling, as machine piling is not desirable in riparian areas due to excessive soil disturbance and compaction. In certain areas, slash can be reduced by requiring that whole trees be yarded and the slash be disposed of at the landings.

Little forage is produced by selection harvest except in group selection units. Group selection creates small openings, usually only a few acres, which can provide good habitat for those species of wildlife that prefer to feed in openings but need trees for nesting and breeding. The forage produced in these small openings is not great and tends to diminish as the canopy of the remaining trees close. Selection harvest generally has little effect on the cover requirements for big game.

The old-growth characteristics of a stand can be retained at the expense of timber volume. If trees are left to die in order to create habitat for cavity nestors or debris dams for fish habitat, this timber volume is lost. In most cases, older trees in excess of those needed for snags will be removed by application of the uneven-aged systems.

It is more difficult to control insects and diseases with uneven-aged harvest than with even-aged harvest systems. Providing the infection is not large, some control can be attained by group selection of the infected trees.

Uneven-aged systems are more costly to apply than even-aged management systems because each tree must be marked. Logging costs are high because little volume per acre is removed and care must be taken to protect the residual stand. Slash disposal is more difficult and costly.

Recreation quality is little disturbed by selection harvest. During the harvesting operation and for a short time thereafter, the noise and debris may disturb some recreationists but the evidence of the disturbance declines rapidly following completion of slash disposal.

Short-term Use vs. Maintenance and Enhancement of Long-term Productivity - Timber harvest by uneven-aged management has little effect on the natural long-term productivity of the area. There is little opportunity to enhance production by introduction of other tree species or by cultural practices such as thinning. The habitats of fish and many wildlife species are maintained due to the retention of forested cover. Visual quality is maintained.

Irreversible and Irretrievable Committment of Resources - The application of selection harvest for an area does not commit that area to timber harvest in the future although it is likely these areas will continue to be harvested by this system in the foreseeable future. Uneven-aged management produces less volume over time than even-aged systems. The volume forgone is irretrievable.

Adverse Effects Which Cannot be Avoided - There are few adverse effects associated with selection harvest. If applied intensively, there will be few snags for cavity nestors and stream debris for pool development. Recreation can be disrupted for a short time while the timber is being harvested. Harvest in riparian areas can cause soil compaction and sedimentation into the stream channel.

Conflicts With the Objectives of Other Agencies Land Management Plans, Policies or Controls - Timber harvest and associated road construction in some areas may conflict with the goals and objectives of the Montana Department of Fish Wildlife and Parks when increased access increases hunting pressure and wildlife habitat is reduced.

Energy Requirements - Since a small percentage of the total harvest is accomplished using selection harvest, only a small portion of the energy required for timber removal is used by this action. The total energy required for timber harvest is shown in Table IV-17.

W. Logging Methods

Three major logging methods are appropriate for the Beaverhead. The selected logging method depends largely on land slope and sensitivity of the soils (Conway, 1976). On slopes under 45 percent, tractor, or rubber tired skidder yarding is generally appropriate. Virtually all logging on the forest in the past has been accomplished using these methods. On 45 to 60 percent slopes, cable or small skyline systems must be used. Very little of these types of logging have occurred on the Forest in the past but will become more important in the future. Helicopter or other aerial methods are not generally economical due to low volumes and high costs. The percentage of areas logged by system varies by alternative. Due to the high costs of harvesting on steep slopes using cable and skyline systems, alternatives with low timber harvest schedule little use of these systems in the first decades. Each of the systems is discussed below. The percentage of acreage scheduled for harvest on slopes exceeding 45 percent slope is shown in Table IV-18.

1. Tractor Logging - The largest impact resulting from tractor logging on the visual resource results from the removal of trees, however, tractors cause considerable soil disturbance especially in skid trails. If the soils are light colored, the skid trails and disturbed areas can be seen from long distance.

Logging with tractors causes soil disturbance on about 28 percent of the harvested area and has the potential to cause soil compaction, excessive soil disturbance and exposure of soil to wind and water erosion (Megahan, 1980; Rice and others, 1972). Soil compaction is a problem on wet soils, especially those with clay or high silt content. Compaction causes reduced infiltration capacity, air permeability and productivity (Froelich, 1979; Froelich and others, 1980). Soil compaction can cause overland flow, accelerated erosion and stream sedimentation which causes reduced water quality. Forest soils most susceptible to compaction are those with high clay and silt content (Cullen and Montagne, 1981; Davis, 1978).

Table IV-18

Timber Land Class
(Percent of total area)

	Alternative/Benchmark*														
	A	B	C	D	F	G	H	Hd	Ha	I	S	Sa	W	MAX PNV	MIN LVL
Period 1															
LT 45° slope	100	100	93	100	85	100	100	100	100	100	85	85	91	100	0
GE 45° slope	0	0	7	0	15	0	0	0	0	0	15	15	9	0	0
Period 2															
LT 45° slope	92	98	91	58	66	82	99	100	100	97	72	67	62	100	0
GE 45° slope	8	2	9	42	34	18	1	0	0	3	28	33	38	0	0
Period 3															
LT 45° slope	75	100	100	100	100	91	95	100	97	95	77	77	100	67	0
GE 45° slope	25	0	0	0	0	9	5	0	3	5	23	23	0	33	0
Period 4															
LT 45° slope	67	87	100	85	95	87	100	41	99	92	68	68	92	96	0
GE 45° slope	33	13	0	15	5	13	0	59	1	8	32	32	8	4	0
Period 5															
LT 45° slope	53	23	48	77	89	28	100	66	100	30	72	73	81	11	0
GE 45° slope	47	77	52	23	11	72	0	34	0	70	28	27	19	89	0

* First decade outputs are based on planned activities. Other decade figures are projected based on continued implementation of the alternative.

Compaction can be avoided by limiting tractor use to the dry season, requiring a cushion of snow, or operating on frozen soils. Skid trails can be located away from problem areas, but even with restrictions, some soil distrubance inevitably occurs when tractors are maneuvered in a logging unit. Most topsoils are thin. Displacement or mixing of this topsoil can drastically change the fertility of bared areas. On especially sensitive soils, the number of skid trails can be limited or another logging system can be required.

Removal of the organic layers or low growing vegetation bares the soil to raindrop splash erosion and overland flow during intense rainstorms (Bethlahmy, 1967; Megahan, 1980). The removal of the protection plus compaction causes a decrease in infiltration rate and the resulting overland flow can cause rills or gullies. In these situations, proper and timely erosion control measures are applied.

Effects on streams and fish populations result from soil disturbance and erosion (Platts, 1980). An increased sediment load in streams causes the intergravel areas to become plugged, reduces insect populations and causes fish eggs to smother from lack of circulating water (Phillips, 1971; Ritchie, 1972). Tractors operating in streams can have a severe impact on the stream channel and cause excessive sedimentation for miles downstream. Tractors are not allowed to operate parallel to streams and crossings will be carefully planned to utilize temporary culverts or log or snow bridges.

Tractor logging has little effect on big-game cover. The major effect is the removal of the trees (Lyons, 1979). Forage growth may be stimulated by the scarification caused by tractors but this is usually minimal.

On soils where compaction is not a serious problem, tractor logging may be of some benefit. Exposure of mineral soil is necessary for seedling establishment (Smith, 1962) and tractor logging does expose mineral soil on a significant portion of the area. However, if topsoil is removed by the tractor operation, the productivity of the site is decreased (Froelich, 1979).

Tractor logging is the least expensive method available for moving logs to the yarding area. This can mean a greater profit to the purchaser or, in some cases, a greater return to the U. S. Treasury and payments to the County.

Recreation disruption and noise of logging operations cause local, short-term degradation to the recreation experience. In alternatives with low timber harvest levels, the disturbance will be minimal because only a few timber sales will be active at any one time and these are likely to be scattered throughout the suitable timber land. In alternatives with high timber harvest levels, there will be numerous sales and the recreation value of large segments of the Forest will be disturbed.

Short-term Use vs. Maintenance and Enhancement of Long-term Productivity - Tractor yarding is the least expensive method to yard logs. In most cases, tractor logging, in itself, has little effect on long-term productivity. However, it is inevitable that some tractor logging will occur on wet soils or on isolated pockets of clay soils. In these cases, soil compaction will occur and reduce productivity. In all cases, some soil will be lost which may effect the long-term productivity and this soil will lower the water quality and fish habitat of the streams. These water quality effects, however, are generally of short duration.

Irreversible and Irretrievable Committment of Resources - Tractor logging the current stand of trees does not irreversibly commit the area to tractor logging in the next generation. However, if the road system is designed to accommodate tractor logging, there is a strong possiblity that tractors will be used in the future. The soil lost or unduly disturbed by the tractors constitute an irretrievable loss to the site.

Adverse Effects Which Cannot be Avoided - Tractor logging can leave skid trails which are unsightly to Forest visitors. These trails will eventually be revegetated or screened from view. During the logging operation, considerable noise and dust is generated by the tractors and soils are disturbed. Soil disturbance is followed by a loss in water quality and perhaps, some loss in productivity. Some fish habitat is likely to be disturbed or destroyed.

Conflicts With the Objectives of Other Agencies Land Management Plans, Policies or Controls - No conflicts have been identified.

Energy Requirements - The energy requirements for timber harvest are shown in Table IV-17.

2. Cable Logging - Cable logging is generally planned on slopes too steep for tractor logging or in areas of sensitive soils. Only a small amount of cable logging has occurred on the Forest in the past. Cable yarding systems are usually operated at external yarding distances less than 800 feet. Because logs are normally dragged along the ground, cable yarding has similar effects to tractor logging but the effect is not as severe because the weight and tread of the tractor is absent. However, skid corridors can be visually obvious and about 23 percent of the soils are disturbed.

Cable logging does not cause severe soil compaction. However, because the logs are dragged uphill and the slopes are generally steep, soil erosion and overland flow similar to tractor logging can occur. Erosion control is required for the corridors.

Except for intensity, the effects of cable logging are the same discussed for tractor logging. The major difference, is that cable logging generally requires more miles of road than tractor logging due to the shorter yarding distances. The effect of roads are discussed elsewhere.

Short-term Use vs. Maintenance and Enhancement of Long-term Productivity - Cable logging effects long-term productivity less than tractor logging because the effect of compaction is not as severe. There is less soil disturbance and less loss of productivity. As with tractor logging, cable logging in itself does nothing to enhance productivity.

Irreversible and Irretrievable Committment of Resources - The fact that an area is cable logged does not commit the area to be logged in the future. However, because the road system is in place and considerable money will be spent in generating a new stand of trees, it is likely that the area will be logged and that a cable system will be used. The soil lost by the use of the system is irretrievable.

Adverse Effects Which Cannot be Avoided - Considerable noise and dust are created by cable logging although it may be less than with tractor logging. Soils will be disturbed and some will erode into streams causing a loss of water quality and fish habitat. The visual quality will be lowered until vegetation grows and hides the view of skid corridors.

Conflicts With the Objectives of Other Agencies Land Management Plans, Policies or Controls - No conflicts have been identified.

Energy Requirements - Energy requirements for timber harvest are shown in Table IV-17.

3. Skyline Logging - Skyline logging differs from cable logging, in that at least one end of the log is suspended above the ground while yarded to the landing. Little or no logging of this type has occurred on the Forest in the past, however, as the Forest becomes more intensively managed for timber, steeper slopes requiring this system will be harvested. Due to the relatively low volume per acre and small diameter timber on the Forest, only small skyline yarding systems with average external yarding distances less than 900 feet are expected to be economically viable. These systems may be used in areas too steep for tractor logging, or where sensitive soils exist, and then only where sufficient deflection is available to operate properly. The major disturbance to the soil is at the upper and lower ends of the skyline cable system. Edges of skyline units can be blended into the uncut forest with greater ease than with either tractor or cable systems. Since roads built for these systems occur on steeper slopes, they are more visible and have a greater adverse effect on the visual resource.

Skyline systems have a low potential for damage to soils except in cable corridors where some dragging of logs is inevitable. This dragging of logs has similar effects as cable logging but is much less severe or extensive. This means that the system has low potential for adverse effects on water quality, fish habitat, or the visual resource. Skyline systems which cross streams must have the logs suspended to avoid extensive disturbance to the stream.

The topography associated with skyline systems creates problems for the disposal of slash. Hand piling is expensive and does not prepare the soil for natural regeneration thus requiring planting. Broadcast burning is used to reduce the activity fuels, remove slash to allow planting, or to expose mineral soil to allow natural regeneration. The slash must be burned in such a way so that a careful balance can be maintained between exposing mineral soil and loss of control (USDA Forest Service, 1978). Weather conditions available to accomplish burning goals occur only for short periods each year, making it difficult to meet silvicultural objectives within necessary time frames.

Skyline logging has little effect on forage or cover. Soil disturbance occurs on only about 5 percent of the area which means that forage species are not greatly stimulated. The silvicultural system and post-logging fire have much more effect on forage and cover than skyline logging.

Skyline logging is more expensive than tractor or cable logging. This can reduce the profit for the logger and can cause a reduction in returns to the U.S. Treasury.

Any logging operation causes disruption of recreation traffic on roads within an active sale area. Interruptions of traffic may be longer for skyline operations than cable or tractor logging. Equipment is difficult to move and can block the roads for several hours at a time.

Short-term Use vs. Maintenance and Enhancement of Long-term Productivity - Since skyline logging causes less severe environmental consequences than more conventional logging systems, productivity is less effected. Although there is some soil disturbance with skyline logging, less is eroded and water quality is seldom severely lowered.

Irreversible and Irretrievable Committment of Resources - The use of a skyline system in the first entry does not preclude the use of other systems in the future, however, roads are designed to preclude use of conventional systems. If harvest is assumed for the future generations, some sort of skyline logging, or an equivalent system, will likely be used. There are no irretrievable commitments of resources.

Adverse Effects Which Cannot be Avoided - Skyline systems have fewer environmental consequences than more conventional systems, however, some soil will be lost or displaced, some water quality degradation will occur and some low-growing vegetation will be destroyed. Slash control will be more difficult due to the prohibition of tractors, construction of firelines and slash piling. Since most skyline operations occur on steep slopes, any visual quality degradation is readily visible and, in some instances, may be visible for long distances. Recreation opportunities will be degraded while the harvest is occurring because of noise, dust and equipment in the roads. Since the system is costly, returns to the operator and the U. S. Treasury can be lowered dependent on the sale price of the timber.

Conflicts With the Objectives of Other Agencies Land Management Plans, Policies or Controls - No conflicts have been identified.

Energy Requirements - Energy required for timber harvest is shown in Table IV-17.

X. Slash Control

Slash, (unmerchantable limbs, tops and cull logs) usually must be removed from timber harvest units and road rights-of-way. Slash disposal must occur in harvest units before regeneration can take place. The objective of slash disposal is to maintain fuel loading within acceptable limits for prevention and control of wildfire, preparation of sites for regeneration and the elimination of barriers to animal movement (Lyon, 1979; Smith, 1962).

Slash may be tractor piled and burned on gentle slopes; handpiled and burned or broadcast burned regardless of slope. In some situations where slash is not evenly distributed and a mature overstory has been left, underburning of concentrations of slash is the only effective method of slash disposal. Lopping and scattering of limbs is also an effective hazard reduction method in areas of scattered fuel concentrations. Slash disposal activity varies directly with timber harvest level. Alternatives which generate the highest timber harvest also generate the highest level of slash disposal.

Slash disposal can cause short-term degradation of foreground viewing (USDA, 1982). In broadcast burning units, all residual vegetation is usually burned and the harvest unit looks scorched and black. Visual degradation usually lasts only until the first growing season. Forbs, grasses and shrubs resprout or seed and grow rapidly after fire. Burned dozer piles leave scars that are readily visible onsite and, in some cases, from several miles away. Burned handpiles are virtually invisable to the casual observer after a short period of time. Hot underburns can cause scorch marks on trunks of remaining overstory and can kill lower branches. These visual effects will last until red needles fall and the scorched bark is replaced.

Air quality will be degraded by slash disposal. Slash disposal activity will be concentrated in times when fuels are dry enough to burn, but favorable for control. Suitable conditions occur for only a short time in the spring and fall. Fire weather conditions will be carefully monitored and burning allowed only when smoke will be rapidly dispersed. The higher the timber harvest level (see Timber Harvest), the greater the air quality problem because more slash will be burned.

Slash is either piled for burning or a fireline is built around the unit for broadcast burning. On gentle slopes, tractors are used to consolidate slash in piles or windrows. This activity has a high potential for degrading the soil resource (Klock, 1975). If care is not taken, topsoil, litter and duff can be pushed into the piles. Excessive mineral soil is then exposed to erosion and the piles will not burn as well because the soil smothers the fire. If piles and the soil beneath them are too dry when burned, the topsoil may be baked, become sterile and impervious to wetting (Dryness, 1976). The soil structure may be severely altered. Little or no vegetation will grow to protect the soil from erosion during the several years necessary for recovery. Handpiling and burning will have no noticeable effect on the soil. Small areas under the piles may be scorched, but handpiles are usually small and burn cool enough to cause little damage. Soil losses caused by burning should be no greater than natural rates if fires are properly managed (Glassy, 1982; USDA Forest Service, 1978).

Firelines around broadcast burn units may be a source of sediment if proper erosion control measures are not taken. Mineral soil must be exposed so fire will not cross the line. The soil surface is then exposed to raindrop splash erosion and overland flow is likely. Ditching to divert water from the fireline into adjacent undisturbed areas will prevent erosion.

Water quantity is affected more by removal of trees than by slash disposal. The only measurable effect on water yield would occur where large areas of mineral soil were exposed and overland flow was increased by a decrease in infiltration rate. Water quality would be affected in the same way (DeByle and Packer, 1972). Overland flow could increase sediment delivery to the streams if a sufficient strip of undisturbed vegetation is not present between the burned unit and the stream (Bennett, 1982, Snyder and others, 1975).

Slash disposal has an effect on fisheries or streams if water quality or quantity is affected. The removal of large woody material from streams or streambanks may affect the formation of pools by destroying potential debris necessary for addition to the stream as instream debris decays. Overland flow from burned units may carry high levels of nutrients which will temporarily enrich the water by adding nutrients used by aquatic insects and subsequently increasing food for fish.

Slash disposal stimulates a flush of shrub, grass and forb growth in the subsequent growing season providing forage for big game and other wildlife species dependent upon early successional vegetation stages.

Complete slash disposal is not desirable. Some material, (up to twenty tons per acre), is necessary to provide cover for small mammals, to provide shelter for regeneration and to provide a source of soil nutrients for the future.

Bark beetles and fungi can build up in slash and spread to living trees. Elimination of slash destroys the habitat for these insects and diseases and controls their spread (Furniss and Carolin, 1977). This problem is usually associated with ips bark beetles and is not a source of infection with mountain pine beetle. Dozer piling in a partial cut can result in mechanical damage to residual trees and make them more susceptible to insect or disease attack.

Heavy concentrations of slash in timber cutting units or road rights-of-way can create physical barriers which impede the normal movements of big game animals. Small animals are less effected.

Costs of slash disposal vary by piling method, size of unit and slope. Handpiling is generally more expensive than machine piling in unit greater than ten acres. Small units cost more per acre than larger units and units on steep slopes are more expensive to treat than those on gentle slopes. Unit cost is independent of alternative, but the higher the timber output, the higher the total slash disposal costs. Slash disposal is a necessary cost to the production of timber and, as such, has an effect on the calculation of PNV. The amount of slash disposal required across the Forest depends on the acres of timber harvested each year. Alternatives with higher levels of harvest will require more slash disposal activities. Some slash control will be required on practically every acre harvested. Average number of acres requiring fuel treatment is shown in Table IV-19.

Table IV-19
Average Annual Fuel Treatment
(acres)

Alternative/Benchmark

Decade	A	B	C	D	F	G	H	DEPT
1	4572	4505	4260	2949	5648	5695	3422	5677
3	6805	8842	10191	2757	5314	6238	5117	6966
5	6390	8941	8408	2713	5786	6317	6137	8103
10	5715	8654	3797	5407	9107	6834	3978	5288
15	7599	7770	6095	2211	5263	8068	3733	5995

Decade	Ha	I	S	Sa	W	MAX PNV	MIN LVL
1	4049	3344	2868	3003	5801	6909	0
3	5715	3849	4700	4941	5394	6586	0
5	7904	3919	5247	5499	5764	6951	0
10	4262	4168	3945	4437	9133	10438	0
15	5396	4345	3509	4152	5175	7835	0

* First decade outputs are based on planned activities. Other decade figures are projected based on continued implementation of the alternative.

Slash disposal activities affect recreation by creating smoke which may degrade air quality enough to cause local short-term problems. Units harvested but unburned are considered unsightly by many recreationist and may be nearly impassable to people if slash loads are high. The problem would be greater in high timber output alternatives and when poor weather for burning causes a time lag between harvest and slash disposal.

Short-term Use vs. Maintenance and Enhancement of Long-term Productivity - Slash control, has little effect on long-term productivity. Productivity is adversely effected if slash is not treated or if slash is treated in a poor manner. There is always a chance in machine piling and windrowing for excess soil to be displaced and erosion to occur. Fertility is lost and the next generation of trees suffers. Burning at the wrong time and allowing the fire to be too hot generally has the same effect. Most other effects of slash control are short-term and have little effect on productivity.

Irreversible and Irretrievable Committments of Resources - Control of slash on a harvest site does not irreversible commit this area to slash control in the future. The purpose of slash control is to provide suitable site for another generation of trees to be established and protected. Considering the time and effort expended in slash control it is likely this future generation of trees will be harvested and the slash created by that harvest will be treated. The soil lost in slash control efforts is irretrievable.

Adverse Effects Which Cannot Be Avoided - The burning of slash releases smoke into the atmosphere. Though this effect is short lived, the more timber harvested, the more smoke. Other adverse effects include visible blackened units which are short-lived and the inevitable displacement and possible erosion of soils.

Conflicts With the Objectives of Other Agencies Land Management Plans, Policies or Controls - Smoke created during slash disposal may exceed standards set by the Clean Air Act for short periods of time. All burning will be coordinated through the State Air Quality Bureau.

Energy Requirements - If machinery is used to dispose of slash, the energy required for a particular site can be signigicant. When units are broadcast burned, a small amount of energy is used in ignition torches. Handpiling slash requires the energy to power chain saws and provide transportation.

Y. Site Preparation

The objective of site preparation is to create conditions favorable for germination of seeds, or for planting. Site preparation for natural regeneration requires the exposure of mineral soils to allow seed germination. Site preparation for planting requires only that the majority of slash be removed to create planting spots and allow the movement of planting crews throung the area.

Site preparation is usually accomplished simultaneously with slash disposal activities, thus the acres accomplished each year are similar. Tractor piling usually exposes sufficient soil to allow germination of seeds and removes sufficient material to allow planting. In lodgepole pine harvest units where natural regeneration is planned, tractor piling is used to trample cone bearing limbs and tops close enough to the ground to stimulate cone opening and seed fall. This is currently the most commonly used method of site preparation on the Forest.

Hand piling removes barriers to planting, but does not expose sufficient soil to allow natural regeneration.

Burning following cable or skyline harvest units must be designed to create conditions favorable to the type of regeneration desired. If natural regeneration is planned, burning must be done when duff moistures are low enough to expose mineral soil. Usually these conditions exist only in the summer and fall months. If planting is planned for the site, duff reduction is not necessary and the units may be available for burning in the spring when duff moisture is high. Spring burning retains much of the duff covering the soil, which reduces the amount of subsequent erosion. The effects of burning and other slash disposal methods are discussed in the previous section.

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Site Preparation and slash disposal usually occur concurrently, therefore, have the same effect on the visual resource, soils, water quality and quantity and fish as the soil disturbing portion of slash disposal.

In cases where debris or competing vegetation is present on a site to be planted, handscalping may be required. Handscalping entails clearing a small area (usually 18 inches in diameter) into which an individual tree is planted. This activity displaces only a minimum of soil and should produce no additional soil erosion.

Environmental effects of site preparation vary by factors other than alternatives, but the higher the timber output, the greater the potential for environmental degradation because there will be more site preparation activity.

Short-term Use vs. Maintenance and Enhancement of Long-term Productivity - Timber productivity of sites depends inpart on how quickly trees are established after harvest. Adequate site preparation is necessary to ensure seedling survival and give them a good start for competition with other vegetation. Care must be taken in site preparation so that the relatively thin topsoils are not removed. These soils are necessary for the maintenance of productivity.

Irreversible and Irretrievable Committment of Resources - Since considerable money and effort is expended in preparing the site for a new generation of trees, it is likely that the next generation of trees on the site will be harvested. Soils lost by site preparation activities is irretrievable.

Adverse Effects Which Cannot be Avoided - The short term adverse visual effects resulting from site preparation activities is unavoidable and will remain until vegetation grows and screens the effect from view. Soils are inevitably eroded or displaced. If burning is used for site preparation, smoke generated. The noise and blackened areas resulting from site preparation can effect recreation use, at least for a short time.

Conflicts With the Objectives of Other Agencies Land Management Plans, Policies or Controls - If burning is used in site preparation, there is a possibility of conflict with the Clean Air Act, however all burning will be coordinated through the State Air Quality Bureau.

Energy Requirements - Energy requirements for site preparation are similar to those for slash control (see above).

Z. Reforestation.

Reforestation occurs after the cycle of harvest, slash disposal and site preparation is completed. Two general methods of regeneration are planned, planting and natural regeneration. High intensity timber prescriptions are planned for planting. Harvest areas in Douglas-fir types are generally planted due to the dryness of the sites and infrequency of cone crops. Planting is used in lodgepole types on steep slopes where slash disposal must be accomplished by broadcast burning and seed bearing cones are destroyed. Natural regeneration is planned in lodgepole types when the slopes are gentle and slash disposal is accomplished by machine piling. On moister Douglas-fir sites, natural regeneration may be planned following shelterwood harvest. The proportion of acres planned for planting varies by the alternative and associated prescription intensities. Alternatives which schedule high amounts of harvest in mixed conifer sites exhibit a high amount of planting.

Tree planting is also scheduled to occur in harvest units where planting failures have occurred and in areas of the regulated timber base where wildfire has occurred. Alternatives which harvest more acres and contain a larger timber base increase the possibility of planting failures and fires occurring on that timber base. Average annual tree planting during the first decade is shown in Table IV-20.

Table IV-20

Average Annual Tree Planting During the First Decade
(acres)

Alternative/Benchmark														
A	B	C	D	F	G	H	DEPT	Ha	I	S	Sa	W	MAX PNV	MIN LVL
882	941	1021	966	457	919	801	890	1060	257	736	748	454	517	0

After the first decade, the amount of planting to be scheduled is directly tied to the area scheduled for harvest.

The primary environmental effect of reforestation is the rapid regeneration of trees. This results in rapid recovery of the visual character of the landscape; return to preharvest levels of water yield, water quality and time of peak flow; and protection of the soils from erosion. Rapid regeneration causes forage to decrease because of shading and competition of the growing trees but speeds the process of recovery of big game hiding and thermal cover.

The severety of damage caused by insects and disease can be minimized by the establishment of a young, vigorous stand of trees. Often, the problems can further be minimized by planting a different species than was harvested or by planting a mixture of tree species. However, care must be taken to assure that the trees introduced are compatible with the sites on which they are planted.

Planting is labor intensive and costs are high. It is more expensive to plant on slopes of over 40 percent and on thin, rocky soils, because higher mortality is expected, therefore more seedlings are planted per acre. The majority of planting projects will be accomplished through public contracts, which will directly benefit the local economy. Due to the high cost, planting has a direct and significant effect on the calculation of PNV.

Short-term Use vs. Maintenance and Enhancement of Long-term Productivity - Reforestation can have a definite effect on productivity of the next generation of trees. The stand is quickly established and begins a new generation of trees, shortening the time for next harvest. Planting can provide species control on compatible sites to reduce the susceptibility of the stand to insect and disease damage. Planting enables the possibility of introducing genetically improved stock which will produce higher volumes over time and are resistant to insect and disease damage. These activities should not affect the native productivity of the site and will give quicker protection to the soils by producing a protective overstory more rapidly. The rapid growth of timber will reduce the forage available to livestock or big game more quickly, but provide the hiding cover needed by big game.

Irreversible and Irretrievable Committment of Resources - Because of the expense associated with reforestation, it is reasonable to assume that the next generation of trees will be harvested. Occasionally, reforestation attempts will fail, due to adverse weather conditions, or problems with planting stock. The growth of fiber lost during the period when the stand is nonstocked is irretrievable.

Adverse Effects Which Cannot be Avoided - A percentage of reforestation attempts will fail. The loss of investment and cost of subsequent attempts connot be avoided.

Conflicts With the Objectives of Other Agencies Land Management Plans, Policies or Controls - No conflicts have been identified.

Energy Requirements - Some energy will be required in transportion of tree planting crews to the field and the use of powered equipment for planting. This is a small portion of the total energy use on the Forest.

AA. Timber Stand Improvement

The major activity of timber stand improvement on the Forest is precommercial thinning. The amount of proposed thinning varies by alternative in relation to the amount of scheduled timber harvest and the intensity of harvest regimes as shown in Table IV-21.

Table IV-21

Average Annual Timber Stand Improvement in the First Decade (acres)

Alternative/Benchmark														
A	B	C	D	F	G	H	DEPT	HA	I	S	Sa	W	MAX PNV	MIN LVL
78	656	523	419	419	656	435	435	435	517	435	435	419	523	0

Precommercial thinning occurs when the regenerated stand is 20 to 30 years old. The objectives of thinning are to provide growing space for the residual trees, to remove less desirable species, to remove disease, insect, or mechanically damaged trees and to select for those individuals which appear to exhibit genetically superior growth and form characteristics. Thinning is designed to increase the final board foot volume and quality of the resultant product.

Thinning can have a minor adverse effect on viewing from the foreground until the slash decays or is otherwise disposed of. The more open aspect of the thinned stands are not likely to be noticed by the casual observer.

The slash created by thinning is a fuel hazard. Broadcast or underburning is not possible without damage to the remaining trees. Handpiling and burning of slash is prohibitively expensive in most cases. Due to the relatively small size of the fuels, decay is rapid and the fuel hazard is short lived.

Thinned stands produce slightly more forage for a short time after thinning but is difficult to utilize due to the slash. Hiding cover for big game may be reduced by thinning but recovers rapidly as the remaining trees occupy the available space (Thomas and others, 1979).

The majority of thinning projects on the Forest will be accomplished through public contracts. This will have a beneficial effect on the local economy.

Short-term Use vs. Maintenance and Enhancement of Long-term Productivity - Thinning is expected to increase overall productivity due to the maintenance of healthy, faster growing stands which are more resistant to insects and disease, the removal of damaged, poor form, or infected trees and the increase in genetically desirable growth and form characteristics. Thinning also increases the percentage of fiber usable as merchanable products. (Daniels 1979)

Irreversible and Irretrievable Committment of Resources - The costs associated with thinning implies a strong committment to harvest the remaining trees in the stand. Due to the high cost of thinning and the long period before harvest, the costs may not be offset by the increase in volume. This loss of revenue is irretrievable.

Adverse Effects Which Cannot be Avoided - The majority of the slash created by thinning will likely not be treated. This will present a fire hazard for a few years after thinning. Temporary losses of hiding cover and the travel barrier created by the slash, will reduce big game use of the areas. The visual resource will be adversely affected for a short period of time. Recent thinning slash is a hazard for the build-up of certain species of bark beetles. These beetles may spread from the slash to live trees.

Conflicts With the Objectives of Other Agencies Land Management Plans, Policies or Controls - No conflicts have been identified.

Energy Requirements - The energy used in precommercial thinning is associated with the transportation of crews to the sites and the use of powered thinning equipment. This is a small portion of the total Forest use.

BB. Road System

Road construction and maintenance is a Forest management activity which has one of the greatest effects on other resources. The primary effects are the displacement of large amounts of soil, increased vehicle access, decreased visual quality, a decrease of elk security and a decrease in fish populations due to sedimentation of the stream channel. The relative effect of roading activities on water quality and sedimentation by alternative is discussed in Chapter II, section D, and Table II-8. Roading of inventoried roadless areas precludes those areas from consideration for wilderness classification.

There are now 1,685 miles of system road on the Forest. About 2,225 additional miles of local and collector roads are needed to complete the transportation system for Alternative I which prescribes no roads in any inventoried roadless areas. At the other end of the spectrum, 5,531 miles of additional road are needed to complete the transportation system for the Max Timber Benchmark which would access all the land potentially suitable for timber outside current wilderness. In all the alternatives, most of the arterial and collector roads would be built by the end of the fifth decade, while most of the locals would be built in the first ten decades. All figures for future road construction are projections based on the continued implementation of the specific alternative.

In addition to the roads planned on Forest lands, the Forest is planning to build or rebuild some existing roads outside the Forest boundary. These roads are necessary to provide access across private, State and other Federally owned lands. In many cases, the purchase of right-of-way will be required.

Table IV-22
Road Construction **
(miles/year)***

	Alternative/Benchmark							
	A	B	C	D	F	G	H	DEPT
Decade 1	52	64	53	30	61	53	38	44
Decade 3	43	53	43	24	50	43	30	39
Decade 5	37	45	37	20	42	36	25	29
Decade 10	23	28	23	13	27	23	16	18
Additional for Mgt*	3550	4324	3570	1965	4103	3550	2448	2490

	HA	I	S	Sa	W	MAX PNV	MIN LVL
Decade 1	45	33	34	36	61	72	0
Decade 5	35	27	26	28	51	61	0
Decade 5	30	23	22	23	43	51	0
Decade 10	19	14	14	15	27	32	0
Additional for Mgt*	2925	2225	2143	2302	4154	4970	

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* Total includes only those additional miles needed for management and does not include 1,685 miles of road existing on the Forest.

** Does not include miles of reconstruction of exterior access roads.

*** First decade outputs are based on planned activities. Other decade figures are projected based on continued implementation of the alternative.

Roads provide access for increased motorized recreation, but eliminate primitive recreation and severely modify semiprimitive recreation. Wilderness attributes of inventoried roadless areas are foregone. People seeking a primitive or semiprimitive setting will either shift their recreation use to another unroaded area or continue to use the same area and suffer a change in the quality of their recreation experience. People who prefer roaded recreation will find greater opportunity to pursue their recreational activities.

Road construction may be necessary across the proposed Continental Divide and Nee-Me-Poo National Recreation Trails. In these instances the integrity of the trail will be maintained and trail head facilities provided as appropriate. The primitive nature of that section of trail will be forgone.

Road management can mitigate potential conflicts in use. Seasonal or year-around road closures can be used to provide a wide variety of recreational opportunities, even though the environment is slightly changed by the physical presence of the road.

Road construction can affect the basic character of the landscape by changing its color, texture, or line. Roads across open areas on steep slopes are highly visible for many miles. Cuts and fills are often visible even through a screen of vegetation. Where the visual resource is important, visual impacts can be reduced by leaving vegetative screens, seeding, or treating cut and fill slopes with a darkening agent. Cuts and fills can be reduced to a minimum. The transportation system necessary to implement any alternative would result in an adverse, though not unacceptable decrease in visual quality.

Road construction on big game winter range causes few problems because construction normally occurs while the animals are on summer ranges. However, after the road is constructed, the area is more accessible to hunters.

Road construction on big game summer range displaces the animals during the period of construction. The animals normally are displaced beyond a topographic barrier such as into an adjoining drainage. (Lyon, 1979) Construction can be scheduled to avoid management activity in adjacent drainages to allow security for the displaced animals. The displacement of animals will continue beyond construction if heavy traffic occurs, or if timber harvest operations follow construction.

Roads constructed on steep hillsides can cause oversteepened cut or fill slopes which present a barrier to animal movement. Escape routes can be provided to mitigate the problem.

Road construction and associated timber harvest reduces elk security cover and increases access for hunting. This can result in a higher percentage of elk harvested during hunting season. Higher percentage harvest of elk may eventually result in more restrictive hunting seasons to stabilize elk populations. Road closures can restore the security of big game animals to acceptable levels (Lyon, 1979), even though the road provides a travelway for horseback riders and hikers.

Roads can cause significant levels of sediment to be delivered to streams. This effect is greatest in the first few years following construction until the cut and fill slopes adequately revegetate, however some sedimentation occurs through the life of the road (USDA, 1980). This effect can be mitigated by implementing Best Management Practices (BMPs) which include but are not limited to, proper construction design, road placement, seeding of cut and fill slopes, providing sediment traps at the toe of fill slopes and by closing roads yearlong or during wet periods when traffic could initiate erosion.

Water quality is affected by road building to the greatest degree of any Forest activity (Rice, 1981; Megahan 1975 and 1976). The most sediment is produced in alternatives which prescribe the most roads. Timber harvest and site preparation activities contribute only a small percentage of the sediment yield.

Potential fish populations on the Forest are expected to increase by the end of the first decade due to restrictions placed on permitted grazing in riparian zones and installation of structural habitat improvements. These activities are designed to improve fishery habitat. In succeeding decades potential populations are expected to drop below decade one populations due to sedimentation resulting from road construction and timber harvest. The decreases will be offset somewhat through the installation of additional habitat improvements. Sedimentation into the stream channel reduces potential fish populations by smothering eggs, fry and food organisms. Fry and fingerlings lose hiding cover and are more vulnerable to predators. Predicted potential populations of catchable trout are shown in Table IV-23. The table shows potential trout populations with and without the effect of additional habitat improvement projects, so the effect of sedimentation is clear.

Table IV-23
Fish Population Potential in the Fifth Decade
(thousands of catchable trout)

Alternative/Benchmark														
A	B	C	D	F	G	H	DEPT	Ha	I	S	Sa	W	MAX PNV	MIN LVL
Without Habitat Improvement														
325	324	325	331	324	325	331	329	330	331	335	333	324	321	362
With Habitat Improvement														
327	332	327	336	331	329	337	334	336	337	341	340	331	301	362

When constructed through productive timber lands, roads remove between three and eight acres per mile from timber prodution. Trees may grow on the surface of some closed roads and on the cut an fill slope of open roads, but will likely be removed during maintenance before becoming merchantable.

Seeding mixtures used for erosion control on cut and fill slopes are chosen to be palatable to wildlife.

Undesirable weed species such as spotted knapweed may be carried to the forest by logging trucks and private vehicles. The disturbed area along forest roads can be a favorable environment for these species and once established, spread to other areas of the forest.

Roads built into unroaded areas result in increased access and increases the potential for man-caused fires. However, this same access makes fire suppression easier by quick delivery of fire fighters and providing fuel breaks.

Road construction is a major cost in all alternatives. The cost reduces returns to the U. S. Treasury and payments to local governments. Many of the roads will be built by local contractors which is a significant benefit to the local economy.

Road construction is mostly planned to access lands for timber harvest. The revenue received from the sale of the timber helps to pay for the roads but in many cases will not completely offset the cost. This is prevalent in areas which are accessed for the first time. In these cases contributed funds, or capital investment funds must be used to build at least a portion of the roads needed for management. These costs will be recovered during subsequent harvest in the area because the majority of roads will already be constructed. This effect lowers PNV in the early decades for those alternatives which enter large acreages of undeveloped lands.

Short-term Use vs. Maintenance and Enhancement of Long-term Productivity - Construction of roads has a long-term effect on productivity. Lands converted to road beds and the cut and fill slopes will no longer produce timber products. Roads remove the habitat for some species of small animals and birds but may create habitat for others. Roads facilitate timber harvest which can have a positive effect on future productivity of the area. Roads change the type of recreation experience available in the area. Actively traveled roads can have a adverse effect on the movement of big game animals. Roads can have an adverse and long-term impact on visual quality.

Irreversible and Irretrievable Committment of Resources - Road construction is an irreversible commitment of resources since roads are essentially permanent features of the landscape. If roads are not built, timber cannot be economically harvested and an irretrievable loss of timber products occurs. If roads are built, wilderness potential, primitive and semiprimitive recreation and unroaded wildlife habitat are irretrievably lost.

Adverse Effects Which Cannot Be Avoided - Roads have an adverse effect on the visual resource. Wildlife habitat and wildlife movement patterns are disrupted, increasing the hunting pressure on big game animals and increasing the possibility of more restrictive hunting regulations. Recreation opportunities in unroaded settings are lost. Wilderness potential is foregone. Road construction and maintenance cause the greatest amount of soil disturbance and erosion. Water quality of streams is lowered due to the sediment produced from the roads and harvest units, destroying or lowering the quality of fish habitat.

Conflicts With the Objectives of Other Agencies Land Management Plans, Policies or Controls - Road construction in some areas may conflict with the goals and objectives of the Montana Department of Fish Wildlife and Parks.

Energy Requirements - Road construction and maintenance requires the largest amount of energy use of any activity on the Forest. This is displayed in Table IV-24.

Table IV-24
Energy Required for Road Construction During the First Decade
(Million B.T.U.'s)

	Alternative/Benchmark														
	A	B	C	D	F	G	H	DEPT	HA	I	S	Sa	W	MAX PNV	MIN LVL
Local	25	31	25	14	29	25	17	20	21	17	15	18	40	36	0
Collector	.3	.3	.3	.1	.3	.3	.3	.3	.3	.1	.3	.3	.3	.3	0

CC. Road Management

Closures and use restrictions of public access to the Forest road system has a major impact on many aspects of Forest use. Road closures may be implemented with gates or with semi-permanent earthen barriers and may be in effect during the entire year or only during certain seasons, depending on the objective of the closure. In general, most arterial and collector roads will remain open year-long, while approximately 75% of new local construction will be closed year-long.

Closures and restrictions can be used to mitigate many of the effects of forest management activities. Closing roads during hunting season in harvested areas partially mitigates the loss of hiding cover. Road and area closures of big game winter range and elk calving areas protects the animals from harrassment during the winter and early spring.

Traveling on wet roadways can cause rutting which in turn can cause increased erosion and sedimentation into the streams. Rutting also increases the maintenance cost of the road and shortens the period of time before the road must be rebuilt. Closures can prevent this erosion and decrease maintenance costs.

Restriction of types of use such as prohibiting snowmobile use but allowing crosscountry skiing, can reduce conflicts between users. Many trails on the Forest are also closed to motor bikes thus reducing conflicts between this type of use and hikers or horse users, as well as preventing soil resource damage.

Road closures change the recreation opportunity from motorized type uses to primitive and semiprimitive experiences.

Road management will remain essentially the same in all alternatives. Generally, existing closures will be maintained. New arterial and collector roads will remain open all year unless major resource management conflicts are identified. Most local roads will normally be closed yearlong or seasonally to protect wildlife, preserve the roadbed and minimize soil and water resource impacts.

Short Term Use vs. Maintenance and Enhancement of Long-Term Productivity - Road closures can increase the productivity of fisheries streams by reducing the amount of sedimentation reaching the stream channel. Closures may allow the road bed to become vegetated with palatable forage species during the period of nonuse, increasing the forage for both wildlife and livestock.

Irreversible and Irretrievable Commitment of Resources - No irreversible or irretrievable commitment of resources have been identified.

Adverse Effects Which Cannot be Avoided - The closure and restriction of road use eliminates some types of recreation use in those areas. Road closures require some form of gating and signing system. Gates can be costly and are subject to vandalism by individuals not in support of the Forest Travel Plan.

Conflicts With the Objectives of Other Agencies Land Management Plans, Policies or Controls - The Forest in cooperation with other Governmental agencies maintains an interagency travel plan for the Forest and surrounding area. This cooperation eliminates the majority of conflicts, however conflicts can occur when roads must be opened for management activities.

Energy Requirements - The energy associated with a travel management plan is associated with the installation of gates and the vehicle when opening, closing or monitoring gate closures.

CHAPTER V

Short Term Use vs. Maintenance and Enhancement of Long-Term Productivity - Road closures can increase the productivity of fisheries streams by reducing the amount of sedimentation reaching the stream channels. Closures may allow the road bed to become vegetated with palatable forage species during the period of nonuse, increasing the forage for both wildlife and livestock.

Irreversible and Irretrievable Commitment of Resources - No irreversible or irretrievable commitment of resources have been identified.

Adverse Effects Which Cannot be Avoided - The closure and restriction of some use eliminates some types of recreation use in those areas. Road closures require some form of gating and signing system. Gates can be costly and are subject to vandalism by individuals not in support of the Forest Travel Plan.

Conflicts With the Objectives of Other Agencies' Land Management Plans, Policies or Controls - The Forest in cooperation with other Governmental agencies maintains an interagency travel plan for the Forest and surrounding area. This cooperation eliminates the majority of conflicts. However conflicts can occur when roads must be opened for management activities.

Energy Requirements - The energy associated with a travel management plan is associated with the installation of gates and the vehicle used when opening, closing or monitoring gate closures.

V. List of Preparers (Chapter V)

Forest Supervisor

Ronald C. Prichard

B.S. - Forest Management; 23 years experience with the USFS, including 20 years in the National Forest System and 3 years in Forest Service Research (fire effects); served eight years as District Ranger (Alaska and Montana) and three years as Deputy Forest Supervisor of the Idaho Panhandle National Forest; completed a variety of Resource Forester positions in Timber, Fire, Recreation, Lands, and Minerals.

Joseph J. Wagenfehr (former Forest Supervisor)

B.S. - Forestry; twenty-two years Forest Service experience; Forester (thirteen years; Range Conservationist (one year); Supervisory Forester (three years); Forest Supervisor (two years).

Robert W. Williams (former Forest Supervisor)

B.S. - Forest Management; Twenty-four years professional experience; three years USDA auditor; Forester (2 years); District Ranger (7 1/2 years); Forest Staff Officer (2 years); Deputy Forest Supervisor (3 years); and Forest Supervisor (6 1/2 years).

Planning Staff Officer

Susan Giannettino

Ph.C., M.A., and B.A. - Anthropology; seven years experience in the Forest Service as Archeologist, Planning Team member, Social Scientist, Writer-Editor and Public Affairs Specialist.

Frank Fowler (former Planning Staff Officer)

B.S. - Forestry; twenty-eight years Forest Service - five years District Ranger; eleven years planning experience including Jewel Basin Hiking Area (1 year), Flathead Wild and Scenic River Study (4 years), Team Leader of St. Maries Planning Team (3 years) and present position (5 years).

Planning Core Team

Earl Sutton - Timber Planner

B.S. - Forestry; Certified Silviculturist; eleven years Forest Service experience with five years in Timber Planning on three National Forests; six years District experience in Timber Sale Planning and Silviculture.

Sherry Milburn - Public Affairs Specialist

M.S. - Counseling, B.S. - Secondary Education, extended major in Biological Sciences; 9 years Forest Service experience participating in the preparation of the 1978 Beaverhead National Forest Land Management Plan and EIS with responsibilities in writing, editing, and graphics, assisted in coordination of the Beaverhead National Forest RARE II program.

Kevin B. Elliott - Operations Research Analyst

B.S. - Recreation Resource Management, B.A. - Zoology, B.A. - Botany; experience as Environmental Education Coordinator, Forestry Technician, Wildlife Research Associate, Computer Analyst, and Operations Research Analyst.

Lawrence G. Michalsky - (former Planning Team Leader)

B.S. - Forestry; Certified Silviculturist; attended 1979 Land Management Planning Training Workshop; eleven years Forest Service experience; participated in development of Rock Creek EIS for Deerlodge National Forest; responsible for Kootenai National Forest's Yaak District land management activities; experience with RAM and MUSIC linear programs and was a study team member - Economic Analysis of Timber for the Montana Wilderness Study Act areas.

Marvin A. Amundson - (former Forester)

B.S. - Forestry; eight years on the Beaverhead National Forest I.D. Team for Forest Land and Resource Planning; twelve years as District Ranger; six years with District Timber Sales responsibilities; five seasons in Regional Fire Control.

Brad Burmark - (Former Operations Research Analyst)

M.S. - Forest Biometry, B.S. - Forest Management; experience in linear program development, system analysis and design and information systems management.

Allen Chrisman - (former S.O. Timber Planner, currently Wise River District TMA)

M.S. and B.S. - Forestry; Certified Silviculturist; two years experience in Forest Service/Bureau of Land Management Timber Sale Preparation; two seasons in Forest Service research, silviculture and two seasons in Forest Service fire suppression.

Interdisciplinary Team

Vick J. Applegate - (former Supervisory Forester)

B.S. - Forest Management; Silviculturist; six summers as a Forestry Technician in Timber Sale Preparation and Silviculture; two years Forestry Technician in Timber Sale preparation, Silviculture, and Fire; three years Forester in Timber, Minerals, and Special Use Management; two years Forester in Timber Sale Prep and Silviculture; and two years Supervisory Forester in Timber, Minerals and Watershed Management.

Peter Bengeyfield - Forest Hydrologist

M.S. - Forest Hydrology, B.S. - Forestry, A.A. - Paul Smith's College; Forester in Private industry for two years; Hydrologist with the Montana Division of Forestry for three years; and nine years as a Hydrologist for the USDA - Forest Service (Wasatch NF - Barometer Watershed, Idaho Panhandle National Forests, and the Beaverhead National Forest.

C. A. Bennett, Jr. - (former Administrative Staff Officer)

M.S. - Education, B.S. - Biological Sciences, Natural Sciences and Science Education (Minor - Anthropology/Archeology), Management/Economic Analysis - three years; Logistician/Logistics Systems Analyst with U.S. Logistics Evaluation Agency; four years Computer Systems Analyst and Program Analyst U.S. Navy - Chief of Naval Education and Training; three years Administrative Officer - U.S. Forest Service, Regions 1 and 9; fifteen years Aviation Management - U.S. Navy and Naval Reserves.

Craig Bobzien - (former Forester)

B.S. Forest Management; Forest Service District experience with responsibilities in timber management and minerals management.

Joan L. Brownell - (former Social Science Technician)

B.A. - Anthropology; two seasons archeological surveying and mapping project (Guatemala); three seasons Beaverhead National Forest Archeologist (Cultural Resource Specialist); five months Advanced Research Assistant in Anthropology/Archeology.

Timothy S. Burns - (former Resource Forester (Admin.))

B.S. - Wildlife Biology with minor in Range Science; Forest Service experience as Wildlife Biologist, District Ranger and Multi-Disciplinary team member and responsibilities in Range Management.

Ronald D. Christianson - Supervisory Forester (deceased)

B.S. - Forestry, and Graduate studies; Resource Assistant - four Ranger Districts; responsibilities for recreation program on three National Forests.

Dwight R. Cook - (former Timber Staff Officer)

B.S. - Wildlife Management; Twenty-four years Forest Service experience - twenty of which has been in resource management; twelve years - multiple-resource management at the District level; eight years in Supervisor's Office - Staff Officer for Wildlife, Range, Timber, Recreation, Fire, Lands, Silviculture, Archeology, Wilderness and Watershed Management.

Larry Coryell - (former Forester)

B.S. - Forest Management; ten years in Silviculture, Timber Prep and Sale Administration in Montana, Oregon and California.

Janet Bean-Dochnahl - (former Resource Assistant)

B.S. - Forest Management (Minor in Range Management); six years Range Conservationist with Forest Service having responsibilities in Range, Wildlife and Watershed; participated in two committees on the Targhee National Forest Land Use Plan and as a team leader or an I.D. Team member on several District level environmental assesments.

Jerry Dombrovske - (former Resource Assistant)

B.S. - Forestry, B.A. - Business Administration; twelve years - General Forest Management; ten years - responsible for District Timber, Lands, Minerals and Watershed functions; two years District Fire Control Officer.

Thomas V. Dvorak - Realty Specialist

B.S. - Forest Management; member of the American Institute of Real Estate Appraisers, extensive training in real estate appraisal, eighteeen years appraising and negotiating for lands, fifteen years with the U.S. Fish and Wildlife Service and five years with the Forest Service.

Gale L. Everett - Personnel Officer

B.S. - Business Administration; eight years experience in the Forest Service as a Personnel Officer.

Henry Greitl - Range Conservationist (retired)

B.S. - Forestry (Range Management); three years on Ranger District with large range emphasis; three years as Assistant in the North Dakota Grasslands; 6 years as District Ranger and eleven years of Range Staff work in Forest Supervisor's Office.

Tom Griffith - (former Range Conservationist)

Presently Resource Coordinator on the Deerlodge National Forest.

Barry Hicks - Dillon District Ranger

B.S. - Forest Management; ten seasons fire experience; eight years wilderness management, dispersed and developed recreation management. Graduate work in silviculture and recreation; six years District Ranger.

Richard L. Hockley - Engineering Staff Officer

B.S. - Civil Engineering; responsible for map compilation - U.S. Army 1956-1958; twenty-three years Forest Service experience related to engineering activies; assisted in the development of the 1978 Beaverhead National Forest Land Management Plan.

Gary Holsten - (former Supervisory Range Conservationist)

B.S. - Range Science; two years as Supervisory Range Conservationist; five years as Range Conservationist on three National Forests; one year as Range Conservationist/Biologist in Environmental Consulting; two summers field work with University of Idaho and Forest Service; member of I.D. Team for Payette National Forest Land Management Plan.

William F. Johns - Silviculturist

B.S. - Timber Management; two years lumber inspector; nine years in Timber Management and Reforestation; eight years as Silviculturist in three Forest Service Regions.

Hank Kashdan - Administrative Staff Officer

B.A. - Journalism; Survey Crew Foreman in Region 3; Business Management Trainee on the Gifford Pinchot National Forest; Business Management Assistant on the Okanogan National Forest; Resource Specialist on the Clearwater National Forest and now Administrative Staff Officer on the Beaverhead National Forest.

David W. Kiebler - (former Highway Engineer)

B.S. Civil Engineering; sixteen months experience in Sanitary Engineering, Cost Share, Road Maintenance, Transportation Planning; fifteen months experience in Traffic Count, Road Location, Land Management Planning and Transportation Planning.

Paul Kokernak - Construction and Maintenance Engineer

B.S. - Civil Engineering; six years Facilities Engineering and Management; two years Transportation Planning; two years of Road Design; four years Road Construction; and four years Road and Structures Survey, Design and Construction.

Gary Leonardson - (former Social Scientist)

Ph.D. - Research and Statistical Methodology, M.A. - Educational Psychology, B.S. - Sociology; three years educational/psychologist research and data analysis in university surroundings; two years social scientist for the U.S. Forest Service, working on social impact assessments and development of methodologies for social assessments and four years assessing people and programs in education.

Ed Levert - Wise River District Ranger

B.S. - Forestry; Certified Silviculturist; Region One experience since 1965 (primarily in Timber management).

James Lincoln - Resource Assistant

B.S. - Forestry; twenty-five years in Forest Service Resource Management.

Vergil Lindsey - Madison District Ranger

B.S. - Agriculture (Forest Management); twenty-five years in Forest Management including eighteen years in Administration.

James R. Lloyd - Zone Fisheries Biologist

M.S. - Natural Resources (Fisheries), B.S. - Fisheries Biology; three years experience as Fisheries Biologist with Bureau of Land Management and eight years experinedc as a Fisheries biologist for the Forest Service providing management of fisheries programs for six Eastside Forests and input to six Forest land use plans.

John H. Lowell - District Ranger (Retired)

B.S. - Forestry; sixteen years as line officer managing Federal land including Districts; annual timber cuts varying from 8-16 million board feet; two Districts with designated wilderness areas; two ski areas and summer resort and other dispersed and developed recreation activities; domestic range programs varying from 1-19,000 permitted animals; major herds of deer and elk and major hardrock and energy minerals programs.

Jan McLaren - Budget and Finance Officer

B.S. - Math, B.A. - Business Management (major in accounting), Certified Public Accountant; Three years resource sectionhead on the Mt. Hood National Forest.

Wally "J" Murphy - (former Range Conservationist)

B.S. - Wildlife Management (Minor in Range Management); two years as Range Conservationist with duties in range management, plant ecology, fire ecology and wildlife habitat improvement and evaluation.

Max E. Morris - (former Forester)

B.S. - Forest Management; four years in timber sale preparation; four years writing environmental assessments and silvicultural prescriptions; four years on Ranger District in oil and gas leasing, prospecting permit administration, hardrock mining administration, special use permit administration and watershed management.

Paul Olson - Resources Forester

B.S. - Watershed Management and Forestry; eleven years with the Forest Service including eight years in timber management and three years in recreation and special uses.

Dick Owenby - Timber/Recreation/Fire/Lands Staff Officer

B.S. - Forest Management, B.S. - Natural Resource Recreation Management, Masters work in Forest Ecology and Silviculture; twelve years experience with Forest Service - five years in Fire, Timber and Recreation; three years District Assistant in Silviculture and Planning; 3 years District Ranger; one year Staff Officer on the Beaverhead National Forest.

Dan Pence - Range/Wildlife/Watershed and Minerals Staff Officer

B.S. - Forest Management (Minor in Range and Wildlife); three years primarily of timber and fire experience on Salmon National Forest; three years Assistant District Ranger, Salmon National Forest in Range, Wildlife, Timber, Watershed, Minerals, Recreation, and Fire; twelve years as District Ranger on Challis National Forest and Humboldt National Forest; three years as Staff Officer on the Beaverhead National Forest.

Neil O. Peterson - District Ranger (Retired)

B.S. - Wildlife Management (Minor in Range and Recreation); twenty-five years with the Forest Service; six years in Timber Management, Fire and Recreation on the Lewis & Clark and Black Hills National Forests; sixteen years District Ranger on three Districts.

Mike Rath - Wildlife Biologist

B.S. Wildlife Management; Certified Wildlife Biologist with The Wildlife Society; sixteen years professional wildlife biologist in State, Bureau of Land Mangement and Forest Service; involvement in numerous land management planning and environmental assesment documents as well as wildlfie research and habitat development work.

Jolene P. Reed - (former Budget & Accounting Officer)

Six years experience in private industry - bookkeeping and working with CPA's; fourteen years with U.S. Forest Service including two years State & Private Forestry, three years research, three years engineering, three years fiscal management in Regional Office and three years in Business and Finance Management on Forests.

Jeff Reiner - Forest Hydrologist (currently on the Lake Tahoe Basin Management Unit)

M.A. - Watershed Management, B.A. - Zoology; experience with private industry, Sawtooth National Forest, Sawtooth National Recreation Area, Boise Boise National Forest and Beaverhead National Forest.

Dave Rittenhouse - (former District Ranger)

B.S. - Forest Management; four seasons trail and campground maintenance and construction; five years in wilderness management, ski area management, heavily developed recreation management, dispersed recreation management and trail management; eleven years District Ranger with responsibility for all District programs.

Robert Rood - (former Computer Specialist)

Eleven years working in data processing field; three years working with data base management systems; worked as a computer operator, programmer and systems analyst

Arnold Royce - Lands/Fire/Recreation Specialist (deceased)

B.S. - Forestry; nineteen years as Resource Assistant on five Ranger Districts in three National Forests; responsibilities in Range, Wildlife, Recreation, Land Uses, Minerals, Water, some phases of Timber Management and Fire Management; five years with the Beaverhead National Forest as the Lands/Fire/Minerals Specialist and one year as the Lands/Fire/Recreation Specialist.

Brad Shepard - Fisheries Biologist

M.S. - Fishery Resources, B.S. - Fish and Wildlife Management; four years as a Fisheries Biologist with the Montana Department of Fish, Wildlife and Parks doing coldwater fisheries research.

Joseph R. Spehar - Wisdom District Ranger

B.S. - Forestry; one year experience as line officer; thirteen years experience on three forests and four districts in New Mexico and Montana. Ten years experience in Recreation, Land Uses, and Minerals; three years experience in timber management.

Richard Stem - (former Forester)

B.S. - Forest Management (Minor in Forest Engineering); three years in Forest Service Timber Sale Preparation; one year industrial forester.

Ron Stellingwerf - Sheridan District Ranger

B.S. - Forestry (Range Management option); nine years Fire experience; three years as a Range Conservationist; three years as a Forester; two years as Supervisory Range Conservationist; District Ranger experience for six years.

Dan Svoboda - Soil Scientist

M.S. - Soil Science, B.S. - Forest Management; one year experience in reclamation of acid strip mine spoils; five years as Forest Service Soil Scientist in District project work, soil and landtype inventory and classification and land management planning.

Nils Troedsson - Timber Specialist

B.S. - Forestry; twenty-five years in Timber Sale Preparation and Administration, including experience in timber planning, recreation management, fire and aviation management, and inter-agency visitor map coordination.

Robert E. Wagenknecht - Landscape Architect

Bachelor of Landscape Arcitecture; seven years Landscape Architect, Beaverhead National Forest; ten years Forest Service experience; one year U.S. Army Corps of Engineers; seven years in private practice.

Leonard A. Walch - (Former Zone Fishery Biologist Trainee)

M.S. - Fisheries Biology, B.S. - General Biology, B.S. - Fisheries Science; nine months with Idaho Fish & Game Department conducting fishing pressure estimates and creel census; two years as Zone Fishery Biologist Trainee conducting fishery input to land use activities such as grazing, timber harvest, mineral exploration and oil and gas leasing and assisted in the development of input to the land use plans for six East Side Forests of Region one.

Lucy K. S. Wilkerson - Forest Geologist

B.S. - Geology; completed two month Bureau of Land Management course for mineral specialists; One and one-half years U.S. Geological Survey in geologic mapping and sampling, library research, engineering geology; two and one-half years providing minerals input to multiple use planning for four western Montana National Forests; one and one-half years as Geologist Trainee with Forest Service in minerals,oil and gas management, land management planning, engineering geology; three years as Forest Geologist working in minerals and oil and gas management, land management planning and engineering geology.

Technical Support

Marcia Rueter Brunkhorst - Office Draftsperson

B.F.A. - Art (Design & Composition); free lance illustrator; four years drafting experience; three years of production/copywriting in advertising and three years Forest Service in Planning.

Linda Fulbright - Operations Research Clerk

Two years education in Business Administration; four years in Planning providing clerical expertise and data entry and analysis support.

Debi Brammer - (former Data Transcriber)

Three years Forest Service experience in Planning providing skills in data entry, analysis and mapping.

Penny A. Latham - (former Data Transcriber)

B.A. - Molecular Biology; One year Forest Service experience in Planning providing skills in data entry, analysis and mapping; Experience in wildlife habitat evaluation techniques and wildlife survey techniques.

Juanita M. Miller - (former Data Transcriber)

Three years eduaction in Elementary Education and Business Administration; One year Forest Service experience in Planning providing skills in data entry, analysis and mapping. Currently Clerk/Typist on Dillon District.

Marsha Sine - (former Data Transriber)

Four years Forest Service experience in Planning providing skills in data entry, analysis and mapping. Currently Forestry Aid on Dillon District providing support in the management of timber data.

Marlene Williamson - (former Data Transcriber)

Four years Forest Service experience in Planning providing skills in data entry, analysis and mapping.

Deborah Yeaman - (former Data Transcriber)

Three years Forest Service experience in Planning providing skills in data entry, analysis and mapping.

Public Comment Typists

Rose Andersen - Computer Assistant

Chris Coleman - Voucher Examiner

Virginia Gowers - Clerk Typist

Marjorie Irvine - Word Processing Clerk

Kathy Womak - Clerk Typist

Trish Woods - Computer Specialist

CHAPTER VI

VI. Consultation With Others (Chapter VI)

INTRODUCTION

This chapter discusses efforts to involve and consult with a variety of publics during formulation of the Forest Plan and Final Environmental Impact Statement (FEIS). It also lists and responds to comments received during the public comment period for the proposed Forest Plan and Revised Draft EIS.

The Forest Service has conducted an active public involvement program throughout the Forest planning process. Federal, State, and local agencies have been informed and consulted. Individual Forest users and interest groups, as well as other interested persons, have also had an opportunity to participate.

The first section of this chapter, CONSULTATION WITH OTHERS BETWEEN THE DRAFT, REVISED DRAFT AND FINAL EIS, summarizes the public involvement efforts undertaken through the planning effort, and summarizes the number, type, and general tone of the responses received during the comment period on the Proposed Forest Plan and Revised Draft EIS.

The second section, AGENCY AND ELECTED OFFICIAL COMMENTS AND FOREST SERVICE RESPONSE, reproduces the comments received from other agencies, local governments, and elected officials along with the Forest Service response to each comment. (The Forest did not receive comments from any Indian Tribe.) All other comments, along with the Forest Service responses to each, are an unbound appendix (Appendix D) to this document. Appendix D is available for review in the planning records at the Forest Supervisor's Office in Dillon, Montana.

The third section, LIST OF AGENCIES, ORGANIZATIONS, AND PERSONS TO WHOM COPIES OF THE STATEMENT ARE SENT, lists all those to whom copies of this statement have been sent.

CONSULTATION WITH OTHERS BETWEEN THE DRAFT, REVISED DRAFT, AND FINAL ENVIRONMENTAL IMPACT STATEMENTS

Summary of Public Participation Activities

The notice of intent to prepare a Forest Plan and Environmental Statement was published in the Federal Register in August, 1980. The Beaverhead National Forest released a Draft Environmental Impact Statement (DEIS) and Forest Plan on April 27, 1982. Between April 27 and September 15 of that year when the comment period ended, Forest officials participated in numerous meetings and several field trips with interested citizens and groups.

The Forest had already begun to develop the Final Plan and EIS when, in September 1982, the NFMA regulations were amended to require each Forest to prepare, using specific criteria, an inventory of roadless lands and to evaluate each of these areas for wilderness in its land and resource planning process. The Forest's planning process had, until that time, assumed that RARE

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II process would resolve wilderness designation of the inventoried roadless lands and that the Montana Wilderness Study Act and the Lee Metcalf Wilderness Bill would resolve the wilderness questions in the West Pioneer and Taylor-Hilgard (Madison) areas, respectively. Thus, wilderness had not been included in the 1982 DEIS as a public issue. In order to comply with the revised NFMA regulations, the Forest incorporated a re-evaluation of the inventoried roadless lands in the planning process. This necessitated issuance of a "revised" Draft EIS that included analysis of the wilderness issue as well as the other six issues identified for the Forest.

In September of 1983 the Forest issued a "Roadless Area Evaluation" brochure, in which the public was asked to help clarify the wilderness issue, assist in compiling information regarding the inventoried roadless lands on the Forest, and help to identify management options for these inventoried roadless lands. This brochure was sent to approximately 750 addressees on the Forest mailing list. Approximately 10 percent of the people who were sent the brochure responded in writing.

The Revised Draft EIS and Proposed Forest Plan Supplement were filed with the Environmental Protection Agency and made available to the public on January 4, 1985. A Notice of Availability was published in the Federal Register on January 19, 1985. News releases were also prepared for the media in Dillon and throughout most of Montana. The release of the documents was also announced by some Idaho media. About 70 copies of the Plan Supplement, 110 copies of the "Overview" of the Proposed Forest Plan Supplement and Revised DEIS, and 160 copies of the entire set of documents were distributed to the people and organizations on the mailing list; 110 copies of the entire set of documents were sent to other Federal Agencies and elected officials. The deadline for submitting written comments was April 15, 1985. The Forest granted additional time for written comments, moving the deadline to May 1, 1985, because the "Notice of Availability" was late in appearing in the Federal Register. Because the Forest received a number of requests for an extension, the comment period was further extended to June 1, 1985. The schedule for preparation of the Plan and Final EIS was such that it was possible to consider all written comments received by June 11, 1985.

Five "Open Door" sessions and three press briefings were held between the release of the Revised Draft EIS and Proposed Plan Supplement and the close of the comment period to present the Proposed Forest Plan and to answer any questions. An "Open Door" session was held on each District, except the Sheridan District, of the Beaverhead National Forest and in Butte, Montana. In all, about 140 people attended these "Open Door" sessions. In addition, members of the planning team presented the proposed Plan at numerous meetings of service and special interest groups and met with individuals in and around Dillon and in Helena, Anaconda, Butte, and Missoula. Records of these meetings and "Open Door" sessions are available at the Forest Supervisor's Office in Dillon. Individual rangers and other members of the interdisciplinary team met with interested groups and individuals during the public review period to explain the Plan.

Public Comments Received

In 1982, the Beaverhead National Forest received over 200 written comments on the Proposed Forest Plan and DEIS. The breakdown of the responses, including the affiliation of the commentors, is shown in Table VI-1. A tabulation of the number of comments and the localities from which they came is shown in Table VI-2. ("Localities" are expressed as local, regional, national for purposes of analysis.) Most concerns centered around the issues that had already been identified for the planning process, the technical nature of and analysis done for the Draft EIS, resource impacts and opportunities, and land management designations made in the Forest Plan. Also, some of the comments made in response to the DEIS and Forest Plan were statements of philosophy that stated preferences for overall management of the Forest.

In 1985, the Forest received 772 written comments during the comment period, including 198 postcards, 59 form letters, and 34 multiple signature letters, from interested people and organizations. In addition, the Forest received about 50 written responses after the end of the formal comment period. (These comments were not included in the response analysis, but were considered as the Forest Plan was finalized.) Tables VI-1 and VI-2, mentioned previously, give the tabulation of responses received during the comment period in relation to affiliation and address of commentors. The major conclusion that can be drawn from these tables is that the level of interest in the Forest Plan by individuals was relatively high and increased substantially from 1982 to 1985. Regional and National publics showed the greatest increases in responding.

Discussions at the "open door" sessions were also documented for use in preparing the Final documents. Summaries of the discussions are documented in Appendix A of this EIS.

Many of the commentors addressed multiple ideas or concerns. For example, commentors on road closures may also address timber harvest levels or wildlife security. An "Index" has been prepared to allow the reader the opportunity to see where these multiple ideas have been expressed. (See Table VI-4.) Only the major points in the comments have been cross-referenced.

The persons, organizations, or agencies who commented on the Draft EIS and proposed Plan in 1982 and those who commented on the Revised Draft and proposed Plan Supplement in 1985 are listed in Table VI-3. This Table lists the commentors alphabetically by affiliation (organization, agency, industry, and so on). The "index" of comments, Table VI-4, lists the commentors by major area of concern.

Table VI-1 Comments by Locality

Comment Origin	# Received on 1982 Draft	# Received on 1985 Revised Draft
Local Counties	117	288
Regional	62	362
National	29	100
Other	4	22
Total	212	772

Table VI-2 Comments by Commentor Type (Affiliation)

Commentor Type	# Received on 1982 Draft	# Received on 1985 Revised Draft
Academic	2	13
Business/Industry	67	112
Private Citizen	97	575
Environmental/Civic/Conservation	30	48
Forest Service Personnel	9	2
Other Federal Agencies	3	11
Local Government	2	2
State Government	2	5
Indian Tribes	0	0
Other	0	2
Members of Congress, the President	0	2
and/or Cabinet members	0	0
Total	212	772

How Public Comments Were Used

Within the broad framework of Forest planning, public input is one of five considerations in the decisionmaking process. Forest Service decisions are based on five factors: 1) the law, 2) technical information, 3) resource capability, 4) professional judgement, and 5) public input. Public input enters into the decisionmaking process when there is room for interpretation in any of the first four factors, especially with regard to which uses will be emphasized. Public input, for example, would not be factor in citing a violator of Federal regulations, but it does influence decisions about whether Forest management could emphasize one use versus another.

In accordance with 40 CFR 1503.4, the comments about the Draft EIS, Revised Draft EIS, Forest Plan and Forest Plan Supplement were treated in the following ways:

1) Comments offering technical corrections or pointing out inconsistencies have been used to revise the final documents.

2) Comments requesting clarification or comments resulting from misunderstanding of what was meant in the documents indicate areas where the proposed Plan or EIS need clarification. Corrections were made, or the reason a correction was not made is explained in the response to the comment.

3) Another type of comment questioned some part of the analysis. In some cases, the analysis was clarified, supplemented, or modified. Where further analysis was not done, the reason was explained in the response to the comment.

4) A majority of comments suggested changes in the proposed Forest Plan direction, outputs, and land use assignments. These comments expressing a differing preference for Forest Service management required careful consideration both from an individual standpoint as well as a collective one. Where feasible and appropriate, Management Area direction in specific areas was changed in response to comments. However, some comments requesting changes in the proposed Plan did not result in any change. Responses to individual comments are contained in this chapter and in Appendix D, an unbound appendix to this document.

The Forest Service use of public comments is documented throughout the Final EIS and Plan. A summary of this documentation is a follows:

1) The Forest Service responses to individual public comments are displayed in this Chapter and Appendix D. This Chapter reproduces the agencies and elected officials comments and the Forest Service response to each. Appendix D, an unbound appendix to this document, is avaiable for review in the planning files at Forest Supervisor's Office in Dillon, Montana. This appendix contains each comment letter along with the Forest Service response.

2) A summary of substantial changes between the Revised Draft and Final Statements is given in Chapter I. Throughout Chapters II and IV, changes are summarized and noted where they occur.

3) The consideration of comments collectively is addressed in this Chapter and, more briefly, Chapter I. In this Chapter, a summary of public comments is discussed by the major resource activity.

Summary of Public Comments

The summary below presents the major issues raised by commentors on the Proposed Plan and Draft EIS's. The summary begins with the concerns that were most prevalent in the public comments and ends with those comments that were less frequently mentioned. Wilderness, either too much or too little recommended, was the most often mentioned subject. Roadless areas, water quality, wildlife, and fisheries and the economic importance of the recreation opportunities supported by these resources were also frequently discussed. The impacts of timber harvest and associated road construction and timber sale economics also generated many comments.

Comments on the 1982 Draft and the 1985 Revised Draft are combined, except where there was a substantial difference in comments on the two documents. The purpose of this summary is to give the reader a "sense" of what was said about the Draft documents, not to provide a synopsis of all the comments. For detail, the reader should check the individual comments. As mentioned previously, these comments and our responses to them are on file at the Supervisor's Office in Dillon.

ISSUES, CONCERNS, OPPORTUNITIES: (This is a general category of comments. Most are addressed in further detail in the appropriate resource categories, following.)

Some commentors urged the Forest to plan for multiple use, utilizing all Forest resources, without causing significant environmental damage. resources. They did not want any wilderness and said that all resource uses were compatible if good management was applied. A few commentors urged the Forest to plan for multiple use, including wilderness.

In general, people were concerned about how a balance was going to be struck between amenity and commodity resource values. Many commentors said the Plan should more adequately provide for management that is more in harmony with the Forest's key values. The majority of commentors agreed that these key values are the more "amenity-oriented" values, including (in order of frequency mentioned): 1) wildlife and wildlife habitat, 2) fisheries, water quality and yield, and recreation (primarily fishing and hunting), 4) wilderness and roadless areas, 5) wildlife, fishery, and watershed values of Big Hole and/or Madison Rivers, 6) scenic values, 7) range, and 8) existing quality environment. These commentors said the Plan placed too much emphasis on timber and road building to the detriment of other resources. They expressed concern that planning should emphasize all interests, not just timber.

On the other hand other commentors said the Plan was too amenity-oriented at the expense of timber production and economic stability. They said the Plan should not emphasize the wilderness, preservationist, or special groups' interests, but should recognize that Federal land must contribute to economic development and timber harvest needs of southwestern Montana. Some of this group of commentors also expressed concern about the future for the minerals and oil and gas development in the area.

A third group of commentors expressed the desire to see the Forest remain "as is." In general, they did not want wilderness designation, nor did they want to see more development, roads, or timber sales.

ECONOMICS AND SOCIAL ASPECTS (These concerns are also displayed under the appropriate resources.)

Many commentors said that the Plan has failed to address the economic and social importance of downstream fisheries, wildlife, recreation, tourism, and watershed values to the economy of the State and to southwestern Montana. They said that the "willingness to pay" values used in the model were too low, especially for wilderness hunting and fishing, and should be substantially increased. Some expressed concern that the "untouched" lands are the "key to success" of tourism and outdoor recreation industries in the State. They expressed concern that timber harvest of below cost sales is compromising recreation values, and that recreation is more stable and more valuable to the economy now and will be more so in the future.

Many expressed opposition to timber harvest and attendant road building as "subsidies" being paid just to keep jobs. They stated that there should be no deficit timber sales or below cost sales and were opposed to having to pay to "have the Forest destroyed."

Other commentors emphasized the economic and community stabilizing importance of the timber mill in Dillon. They saw lowered harvests and "improper assignment of commercial timberlands" in the Plan as a threat to the continued existence of the mill. Some expressed concern that unemployment is already too low without putting more people out of work by closing the mill.

Some commentors expressed concern that overemphasis on amenities is contributing to economic instability, and that jobs, timber, mining and grazing are more important and needed to stabilize the economy.

Several commentors also addressed the importance of other values, such as talc and other minerals and grazing to the economy. Some said the Plan should address the possible impacts to Forest communities of a oil strike on Federal lands.

Some commentors addressed the costs used by the Forest for timber production. They said that the production costs seemed too high, and questioned stumpage values and road costs. Others said that the values projected for timber products and demand for those products were overly optimistic and that imcorrect economic values used in computer modeling let to "erroneous conclusions," and poor assignments that favored timber harvest over recreation, wildlife, fisheries, and scenic values.

WILDERNESS

1982 Comments

Even though the 1982 DEIS did not address the wilderness designation issue, commentors voiced support and opposition to the areas as proposed in RARE II and identified in the Plan. Their comments were as follows:

Support Wilderness

Support the maximum amount of land to be preserved as wilderness; support present wilderness proposals.
Believe that the Plan should have deferred a nonwilderness assignment of the West Pioneers pending Congressional decision regarding the status of this Montana Wilderness Study Area.
Support West Big Hole Proposed Wilderness; include the Rock Creek drainage.
Support East Pioneers Proposed Wilderness; add area above Mono Creek campground.
Recommend West Pioneers for Wilderness designation.
Recommend wilderness for East Fork of Blacktail Deer Creek.
Recommend wilderness for the head of Nicholia Creek.

Oppose Wilderness

No more wilderness.
Drop wilderness additions to the Pintlers,the West Big Hole, West Pioneers, and Bear Trap.

1985 Comments

Wilderness was the most often addressed subject in the 1985 responses. In general, commentors on this subject either requested that a number of areas be recommended for wilderness classification or opposed wilderness designation entirely; prowilderness comments were most prevalent. The comments were as follows:

Support Wilderness

Many commentors were concerned that the Forest's wilderness recommendations were inadequate in light of the amount and "quality" of the roadless lands of the Beaverhead National Forest. Most of these commentors, particularly those from "National" or "Regional" categories, said that they supported the "Conservationist Alternative." This alternative was presented in detail in The Wilderness Society's "Critique of the Beaverhead National Forest Proposed Plan" and requests the following areas be protected and designated as wilderness:

> North Big Hole Addition to the Anaconda-Pintler Wilderness (37,000 acres), The Storm Lake Addition to the Anaconda-Pintler Wilderness (1808 acres), the West Big Hole (86,000 acres), the West Pioneers (148,000 acres), the East Pioneers (80,000 acres), Italian Peaks (52,000 acres), and the Tobacco Roots (59,700 acres - 56,200 acres on the Beaverhead).

The reasons given by commentors for these wilderness primarily focused on the "excellent" quality of the watersheds, wildlife habitat protection, and preservation of the "primitive" recreation opportunities.

In addition, the "Conservationist Alternative" recommends the following areas for "more sensitive management":

> Snowcrest (97,000 cares), Elk River (31,800 acres), Garfield Mountain (42,777 acres), South Big Hole (17,200 acres), West Big Hole (20,000 acres), Toomey-Sawlog (12,100 acres), and Mount Jefferson (4,474 acres).

The management proposed for several of these areas was very similar to that proposed by the Forest. However, the "Conservationist Proposal" was specific in requesting that timber harvest and road construction be precluded in the "sensitive areas."

In addition to those who supported the wilderness recommendations made in the "Conservationist Alternative," there were commentors who supported wilderness for other inventoried roadless areas on the Forest.

Oppose Wilderness

Many local commentors opposed wilderness, saying that the area (primarily Beaverhead County) needed the economic support provided by the timber industry; some said that they were concerned that they would lose their jobs if the wilderness recommendations made in the Proposed Plan were not deleted. Some commentors said that the "useable" lands are shrinking and the Forest should be kept open for all people to enjoy. They said that the wilderness designation "caters to a select few" and is inaccessible to many who are unable to hike and backpack. They also said the present wilderness is sufficient to meet demand, that the areas proposed do not meet the criteria for wilderness, that the Forest Service should use "backcountry" or "roadless" designations rather than wilderness, or that the Forest should be left "as is" for all to use and enjoy.

Specifically, commentors expressed opposition to wilderness designation of the West Big Hole, East Pioneers, and West Pioneers.

ROADLESS AREAS

Even though the Forest did not identify management of roadless areas as an issue in the 1982 Plan, commentors, primarily Regional and National, stated preferences for retaining "as much of the Forest as possible" in a roadless, natural condition. They specifically requested that the Forest retain the roadless nature of area in the East Fork of Blacktail Deer Creek and Clam Valley.

In 1985, many commentors (most of them from the Regional and National categories) asked that the Forest protect roadless lands. Much of this support for roadless lands was in conjunction with support for the "Conservationist Alternative" proposals for "sensitive management," as outlined above. Many of these commentors expressed concern that the Forest was trading off the roadless area values of and recreation opportunities on these lands to provide "deficit" (below-cost) timber sales to "subsidize" timber industry. Some said that retaining the high degree of roadless acreage is the best way to assure continued high watershed, wildlife, and other values. A few said that the Forest should designate as wilderness all roadless areas that could not be protected otherwise. Specific concerns were expressed for retaining the roadless values in the West Pioneers, East Pioneers and the East Fork of Blacktail Deer Creek.

WATER QUALITY AND YIELD

Commentors from all locales expressed concern that water quality and quantity, including timing of runoff were given cursory treatment in the DEIS. They said that these should be addressed more thoroughly, that water quality should be the Forest's number one priority, and that the Forest Plan should meet State of Montana Water Quality standards. Those commentors who identified with the "Conservationist Alternative" and many others expressed particular concern for the "blue ribbon" quality of the Big Hole River and said that the Forest needed to better recognize the importance of that watershed. Commentors asked for a drainage-by-drainage watershed analysis for"key" drainages, including the Big Hole, West Fork of the Madison, Ruby, and Beaverhead Rivers. Most people who commented on water quality were concerned that the Forest should closely monitor timber harvest, road construction, and grazing in riparian zones to ensure that management activities were not impacting water quality and the fisheries resource. They said that actual stream loads and fish populations should be carefully and periodically monitored and evaluated and that any departure from model expectations should trigger a halt to management activities in the affected drainage.

Some commentors (in 1982) expressed concern that something was wrong with the sediment model, that sediment yield could not be the same for all alternatives, and that it was illogical for fish populations to rise in comparison to the rise in sediment. In 1985, commentors again expressed doubt in the sediment model and in the dependent downstream fisheries recruitment model. They said that the Forest needed more and better data and that the models should be improved to better measure changes.

WILDLIFE

Many of those who wrote expressed concern for maintaining wildlife habitat for all species, but primarily elk. This concern was evident in comments from local, regional, and national publics.

Elk

In general, the commentors were concerned that the Forest could not maintain enough security cover for the "nationally known" elk herd and sustain the proposed harvest levels. Additionally, these people opposed the amount of new road construction associated with timber harvest, saying that the roads would open up too much of the Forest and that the new closures would be more than we would be able to "police."

Some said that the Forest needed to indicate in the EIS impacts to elk populations and elk hunting should season and regulation changes not be implemented by the Montana Department of Fish, Wildlife, and Parks. Others said the public is not likely to stand for tighter hunting regulations or permit-only hunting. They indicated that the Forest Service should not put the burden on the Montana Department of Fish, Wildlife and Parks, but should manage so that elk security habitat levels remain adequate to maintain or increase the elk herd size, numbers of big bulls, and "quality" of hunting that are nationally recognized and important to the economy. The Forest was cautioned to "concentrate on preventing degradation of habitat rather on mitigation." Respondents reasoned that the Forest would be better able to maintain habitats by lowering the timber harvest levels, eliminating harvest and reducing or eliminating grazing of domestic livestock on areas with "significant wildlife values (such as winter range and calving areas), and using road closures and other measures to avoid impacts to elk. Commentors also stressed the need for "good interagency coordination" in management of fish and wildlife.

Some private landowners (primarily area ranchers) said that they were not opposed to increasing the elk herd as long as these increases do not cause depredation on private lands. Some commentors were opposed to increasing numbers, because they feel there are already too many elk and that elk are already impacting private lands in some areas.

Fish

Many commentors expressed concern that the Forest Plan should better recognize and ensure water quality to maintain the nationally-recognized cold water fisheries. Many pointed out the importance of the fisheries resource to the economic base of "southwestern Montana," while others addressed the ecological importance of protecting and/or restoring aquatic habitats to maintain game fish populations. Environmental groups, and individuals representing environmental concerns, expressed a need for the Forest to better or more "realistically" discuss sedimentation and better display the effects of sedimentation on fisheries resources. Decreased ability to retain snowpack in harvested areas, and associated low season flows was mentioned as important factors affecting changes in fish populations. Some individuals requested that special fisheries management be applied to "key" fisheries. Others were concerned that the Forest should concentrate on preventing damage to fisheries habitats and populations rather than on mitigation.

Threatened and/or Endangered (T&E) Species and Species of Concern

Although some commentors expressed concern for maintaining habitat for T&E Species, most comments considered in this category addressed the arctic grayling, the westslope cutthroat, and the trumpeter swan. Many who expressed concern for maintaining the "blue ribbon" fisheries also asked that the grayling and westslope trout be identified as indicator species and monitored to determine the effects of Forest management activities. The Trumpeter Swan Society and various chapters of the Audubon Society supported identifying the trumpeter swan as a sensitive species, giving this species more consideration in planning, and protecting nesting areas.

Habitat Improvements and Monitoring

Some commentors expressed support for increased emphasis on habitat improvements for wildlife and fisheries, saying that the dollars for improvements should increase over time to assure adequate funding for improvements and monitoring.

RECREATION

The most frequent comment in this category expressed concern that the Forest Service had underestimated the importance of recreation to the economy and to the recreating public in southwestern Montana. They pointed out the economic benefits derived from fishing and hunting and related tourism, and contrasted these benefits to losses due to "deficit" (below-cost) timber sales. "Conservationists" and others said that fishing and hunting recreation should not have been "lumped" with the other types of recreation, because this tended to minimize the benefits provided by these two "valuable" recreation opportunities. Others pointed out that nonresident visitor use should have included in the analysis.

Many commentors emphasized the the need for the Forest to provide the a wide variety of recreation opportunities to Forest users, and said that the Forest Service had underestimated recreation demand. Roadless, "primitive," nonmotorized settings were preferred by many. Some said that backcountry should be for backpackers, while others asked to have more "primitive" opportunities available to for motorcycling and/or snowmobiling. Winter recreation opportunities were identified as being important, needing more emphasis, and needing to be expanded.

Timber industry, representatives from some mining operations, the oil and gas industry, and some local area commentors expressed concern that recreation demand projections were "unrealistically high," considering the distance to major population centers. They said that there we're enough recreation opportunities available, and that there was more need for development to provide jobs than for more recreation.

Many commentors expressed support for the West Big Hole and West Pioneer Recreation Areas. In 1982, many commentors asked that the Little Lake drainage be added to the West Big Hole Recreation Area. In 1982 and 1985 some commentors asked that the West Pioneer area be expanded to include the Bobcat and Odell Lakes areas or the whole MWSA area to protect the grayling and high quality semi-primitive recreation settings. Some commentors expressed support for the Rock Creek/Browne's Lake Recreation Area and the Grasshopper complex. Several commentors said that more land/more areas should have been included in MA 8. In 1982, commentors expressed interest in recreation management in the Tobacco Root Mountains. In 1985, interest in recreation management targeted the Tobacco Root Mountains, the Big Hole drainage, the West Pioneer MWSA area, the country around Peterson Lake and Thayer and Fox Creeks, the Elk River-Lobo Mesa country, and a portion of the the LaMarche Creek drainage.

Some commentors opposed recreation area designation in general, saying that it moves areas so designated toward wilderness and removes them from multiple use and timber production.

TIMBER

Timber Harvest, General

Opposition

Many commentors, both in 1982 and in 1985, expressed concern that the timber harvest was too high. Primarily, they were concerned about the poor economics of timber harvest; impacts of timber harvest on wildlife, water quality and yields, recreation (particularly hunting and fishing), and roadless area values; and the inability of the land sustain such a harvest level. Many were disturbed by the "sheer extent" of roading and logging proposed throughout the Forest; although, the proposals for the Big Hole drainage were most often criticized.

Many commentors opposed timber sales that would result in costs to the "taxpayer" or "general public." A large part of these commentors said that they had read The Wilderness Society "Critique" or Randall O'Toole's report and were concerned that the returns to the government from timber sales were so low. They opposed the building of expensive roads for the purpose of harvesting "marginal" timber, reasoning that the roads were too expensive and too damaging to other values. They opposed timber subsidies, citing that the current values inherent in the areas scheduled for harvest, including the value of having the timber "in place", outweighed the value of the timber.

As a part of their opposition to timber harvest, commentors expressed concern for other resources which would be impacted by timber harvest. These were (in order of frequency of expression):

1) Fisheries (both on-Forest and downstream) and fishing, water quality, riparian zones;

2) Elk (including population size, herd sex ratios, numbers of mature bulls), security cover and other critical wildlife habitats, hunting;

3) Aesthetic values, roadless lands, general recreation and /wilderness values, social and economic benefits; and

4) Livestock grazing (by removing natural barriers and by opening the areas with additional roads).

Some people said that riparian and mesic lands should not be logged. They felt these areas had particular significance to wildlife, recreation, and watershed values and wanted to see, at a minimum, a 100-foot buffer zone left along all perennial streams and around lakes and other bodies of water, including moist areas.

The West Pioneers was mentioned as an area where some people felt logging would impact "prime wilderness quality" and where timber quality was marginal. Many were concerned about the loss of security cover for elk (particularly during hunting season) and about degredation of the renowned Big Hole River fishery and fragile alpine lakes. Many expressed concern for lands on the periphery of the West Pioneers Recreation Management Area where timber management was assigned.

Many commentors also opposed logging and road building in the West Big Hole. They said timber would severely impact watershed values, thereby impacting downstream grayling and other trout populations. They also said that timber harvest would impact the critical elk habitat and scenic and recreation values of the area. They urged the Forest Service to preserve the "blue ribbon" nature of the Big Hole River.

Support

The timber harvest was criticized as being too low and confined to too small a timber base by representatives of timber industry, by some who said they were employed by timber industry, and by other local and regional commentors. In general, these people supported timber harvest, saying that "timber is a harvestable crop" and that the local lumber industry is important to the economy. The local mill was particularly critical that the Forest Service was not being responsive enough to its needs and to the people who depended on the mill for a job. Regional industry representatives pointed out that all of the Forests in this area are reducing their timber harvest programs, and expressed concern for the viability of the timber industry, in general, should Forest Plans with reduced offerings be implemented.

Timber industry and other commentors who supported timber harvest reasoned that impacts were not as great as the public was being led to believe. They pointed that there are benefits of harvest in terms of providing age class diversity, in reducing losses to mountain pine beetle, and in reducing the threat of large-scale fires.

A few commentors, including timber industry, argued that the Proposed Plan did not achieve a balance between recreation and wildlife and timber, and that measures being taken to protect other resources were more restrictive than necessary. They said that standards for providing wildife security and visual quality objectives, in particular, posed more of a conflict with timber harvest than necessary and drove up harvest costs. Some said that the timber harvesting impacts to elk would not be severe and could be tolerated. They reasoned that timber management would, in the long run, prevent declines in elk numbers caused by excessive downfall of timber and massive wildfire.

Timber Management Activities

The issues addressed under this topic were the use of clearcutting, the size of openings, rotation lengths, and the length of timber sale operations. Some commentors opposed clearcutting in general. Others emphasized that clearcuts would be more acceptable if they were smaller and should not, without exception, exceed the 40-acre limitation. In concern for wildlife, some commentors said that timber harvest should not occur next to any cutting unit until the harvested area could provide adequate security cover, even if it meant lengthening rotations, and that timber sales should be harvested in as timely a manner as possible to avoid long term impacts to wildife.

Several comments were received supporting timber harvest of dead/diseased lodgepole, harvesting deficit sales for the good of the Forest, shortened timber rotations, and closing roads after timber sales.

Timber Analysis

Timber analysis comments focused on two aspects: economics of harvest and timber suitability. Those who supported timber harvest (primarily timber industry and its dependents) questioned the suitability analysis, saying that there was a "constant eroding of the timber base." They were concerned that each successive Forest Plan has assigned more timberland to management emphasis other than timber. They felt that once the land was assigned to something other than timber, it would nearly impossible to get the land back into the suitable base. The were particularly critical of the amount of land they recognize as being suitable for timber management being assigned to "custodial" management.

In addressing economics, commenters who supported timber harvest criticized that costs of production have not increased and will not increase at the rate projected in the EIS. They also criticized the standards, saying that the increased protection for other resources, to the standard demanded by the Forest Plan, is unnecessary and increases operating costs substantially. This makes it very difficult for timber industry, which is already operating on a very slim profit margin, to remain viable during this time of depressed economics.

On the other hand, The Wilderness Society "Critique," the "Randall O'Toole Report," and "conservationist-oriented" commentors criticized the use of unrealistically high future timber values in the computer model and in the "assignment" process. These commentors argued that using the higher timber values led the Forest Service to include in the timber base a substantial amount of land that, using more realistic values, would be economically unsuitable for harvest. The focused particularly on the roadless lands included in the base, which would require new road construction to implement the harvest schedule.

ROADS AND ROAD MANAGEMENT

Although a few commentors supported building roads for firewood gathering and Forest management, most commentors opposed roading. They wrote that the current roading was adequate or more than adequate and wanted no more road construction. They were particularly critical of roading for deficit or below cost timber sales, and said that road construction would impact fisheries, roadless areas, wildlife, riparian zones, watersheds, soils, and recreation opportunities, especially hunting and fishing in the Big Hole drainage. Many who clearly stated preferences for wilderness and/or roadless management, also asked that the Forest Service "freeze the roads" at the existing mileage or that roads not be constructed in roadless areas.

Comments from several individuals and from timber industry indicated a need to consider lower standard roads or, where possible, temporary roads. They felt that building roads to a lower standard would have less effect on the other resources and would reduce roading costs, thus reducing timber production costs and making sales more economically attractive.

The effectiveness of closures as mitigation for wildlife and grazing was questioned be many commentors. They were concerned that closures could be breached easily and that the Forest Service would have difficulty in enforcing closures, given limited funds and personnel for enforcement. Some said that all roads, including collectors, should be closed from the point of entry as soon as the timber is removed. Several commentors addressed trail closures needed to avoid damage by motorcycles.

Some commentors said that the Travel Plan should have been a part of the Forest Plan, and that future goals and policies for the road management program should have been addressed in greater detail in the plan. They felt the Plan should address road closures and off-road vehicle management. Some people addressed specific closures that were needed or areas they wanted open with no or minimum restrictions. Some expressed support for or opposition to specific in-place closures. Several commentors said that travel restrictions should be reviewed periodically with local or involved publics to determine the need for the closures.

ACCESS AND RIGHT-OF-WAY

Some commentors approved of acquiring access; others disapproved of more access, saying that there was already enough access to the Forest. They said that additional access would impact elk security and create problems between landowners and recreationists. There was also some concern expressed about additional access encouraging subdivision that could be in conflict with Beaverhead County plans.

Some commentors expressed concerns about the rights of landowners when rights-of-way pass through their lands. Others were concerned about or opposed condemnation of private lands.

DOMESTIC LIVESTOCK GRAZING

The majority of comments in this category focused primarily on the issue of the conflicts between wildlife and domestic livestock on Forest Service range and on wildlife (big game) depredation on private lands.

Opposition

Many commentors felt that the division of forage use between wildlife and livestock should be more favorable to wildlife and that winter range is critical to continued existence of the elk herds. Some expressed the need to leave more forage for elk on summer and fall range, as well as to decrease the utilization by domestic stock on critical winter range. Some felt that a reduction in livestock would benefit all wildlife species and improve the condition of "other Forest resources." A few said that domestic grazing "should be phased out". Some supported the development of transitory range for livestock grazing to help ease the conflict between elk and cattle.

Some commentors opposed increasing Animal Units Months (AUM's) for domestic livestock. They felt that the increase would create impacts to plant vigor, riparian zones and fisheries. Some commentors addressed areas of particular concern, where they felt grazing should be reduced or severely restricted to protect other resource values. These areas include: the Ruby River drainage, the Little Lake drainage, the West Fork of the Madison, and the north end of the Tobacco Root Range. They also felt that livestock use should be limited or prohibited on moist sites and in riparian zones to protect the riparian zone vegetation, stream banks, and water quality. Maximum utilization rates can be detrimental to fisheries by removing cover and overhanging vegetation. They suggested that cattle should be removed from areas of larger, low gradient and open meadow streamsides.

Support

Other commentors felt that the division of forage between wildlife and domestic livestock should be more favorable to livestock, because ranching is an important part of the local economy. Ranchers felt that a decrease in grazing might jeopardize their operations and expressed concern that there was an "overemphasis" on wildlife protection. They pointed out that private lands support wildlife, especially during winter. Some expressed approval for increasing AUM's, while others expressed concern that developing transitory range for livestock use may be difficult, depending on the proximity of the range to the primary grazing ranges and the need for fencing, water developments, and so on.

Allotment Management, General Comments

Commentors generally supported implementation of AMP's on allotments to improve range and other resource conditions, but some expressed concern about the commitment and ability to monitor utilization with dwindling budgets. Some commentors expressed concern that rest rotation systems are inadequate in restoring riparian areas, and that road construction, timber harvest, and grazing should not be implemented unless an equal proportion of funds are guaranteed to riparian improvement and monitoring projects.

Commentors who addressed predator and/or noxious weed control generally favored control, but felt that control programs should not pose a threat to human life. Commentors generally favored range improvements but some added that these improvements should not be costly to the permittee.

MINERALS, OIL AND GAS

In 1982, commentors were concerned that the Forest Service had not adequately addressed minerals, oil, and gas potential, nor had the Forest Service adequately addressed potential for those commodities or impacts to that potential as a result of restrictive prescription assignments. They wanted the Forest Service to develop a "minerals" alternative and to display for all the alternatives the tradeoffs that would occur as a result of the possible implementation of those alternatives as they relate to minerals and energy.

In 1985, most commentors expressed satisfaction with the minerals information and displays as presented in the Revised DEIS. However, they urged that areas with potential for minerals and energy resources be excluded from wilderness designation or other designations which would be incompatible with their development.

In 1982 and 1985 owners of mineral claims expressed concern that they would be able to develop their claims with a minimum of restrictions.

LANDS AND LAND ADJUSTMENT

A few commentors in 1982 encouraged the Forest to address land exchange proposals in the Madison. In 1985 a few commentors encouraged to pursue and address other proposals as a means of consolidating ownerships and reducing operating costs.

MONITORING

Commentors expressed concern that all management activities should be contingent upon adequate funding and mitigation of impacts where called for. They stated that development activities should be modified or curtailed if the effects are inconsistent with the Plan's expectation. Several commentors expressed concern for site specific, accurate and frequent monitoring of sedimentation, water quality, riparian habitat impacts, wildlife impacts. A few commentors encouraged the participation of the Department of Fish, Wildlife, and Parks in the monitoring efforts.

FOREST-WIDE MANAGEMENT STANDARDS

Overall, commentors addressing this category in 1985 supported the standards and guidelines and said they were much improved over those presented in 1982; however, some commentors requested changes and or improvements.

PLANNING PROCESS, GENERAL COMMENTS

Although these comments were relatively infrequent, a summary of them is included below to give the reader an idea of the breadth of the comment received on the planning process in general:

> The planning process must follow the proper laws and regulations.
>
> The Planning Team "must be interdisciplinary, not multidisciplinary." The team needs full time wildlife and fisheries biologists in order for these resources to get their "fair share." There are "too many foresters on the team."
>
> There needs to be better coordination with other agencies, especially Department of Fish, Wildlife, and Parks, and other Plans before the development of a Final Plan.
>
> There was inadequate public review and participation in the development stages of the Plan; public involvement needs to be ongoing. Public involvement and comment is usually ignored.
>
> The Forest has done enough planning and needs to get on with implementation.
>
> The Forest has done a good job in public involvement and in helping the public understand the complex plans. (1985 commentor)
>
> The Forest needs to resolve conflicts between opposing interest groups before the Final Plan is completed. Others said it was time to stop planning and get on with implementation.
>
> The Plan needs to retain the flexibility to respond to changing needs and demands.
>
> The range of alternatives considered is insufficient, because 1) all alternatives contain too much road construction, 2) there is no wildlife alternative, 3) there is no recreation alternative, or 4) there is no variation in range outputs.

TABLE VI-3 LISTING OF PUBLIC COMMENTS BY AFFILIATION

FEDERAL AGENCIES
ELECTED OFFICIALS

NO.	AGENCY/OFFICIAL
11	ROBERT FINK, CHIEF WESTERN DIVISION OF PROJECT REVIEW ADVISORY COUNCIL ON HISTORIC PRESERVATION
719	ANTHONY R. MORRELL, ENVIRONMENTAL MANAGER BONNEVILLE POWER ADMINISTRATION
34	LAWRENCE BEMBRY, ACTING DIRECTOR OFFICE OF EQUAL OPPORTUNITY
12	STANLEY N. HOBSON, STATE CONSERVATIONIST USDA SOIL CONSERVATION SERVICE
77	GLEN H. LOOMIS, STATE CONSERVATIONIST USDA SOIL CONSERVATION SERVICE
32	DON-MICHAEL BRADFORD, CAPTAIN, USAF DIRECTOR, ENVIRONMENTAL PLANNING DIVISION U.S. DEPARTMENT OF THE AIR FORCE
371	JOHN F. WARDELL, DIRECTOR REGION 8 - MONTANA OFFICE U.S. ENVIRONMENTAL PROTECTION AGENCY
1	ROBERT F. MATUSCHEK, DIRECTOR OFFICE OF COMMUNITY PLANNING & DEVELOPMENT US DEPT. OF HOUSING & URBAN DEVELOPMENT
98	D'ARCY P. BANISTER, SUPERVISOR MINERALS INVOLVEMENT SECTION USDI BUREAU OF MINES
108	ROBERT F. STEWART, REGIONAL ENVIRONMENTAL OFFICER USDI ENVIRONMENTAL PROJECT REVIEW
100	ROBERT C. PEARSON CENTRAL MINERALS RESOURCES USDI GEOLOGICAL SURVEY
151	HONORABLE PAT WILLIAMS U.S. HOUSE OF REPRESENTATIVES
9	HONORABLE JAMES A. MCCLURE UNITED STATES SENATE COMMITTEE ON ENERGY & NATURAL RESOURCES

STATE AGENCIES
ELECTED OFFICIALS

NO.	AGENCY/OFFICIAL
27	JERRY M. CONLEY, DIRECTOR IDAHO DEPARTMENT OF FISH AND GAME
82	HONORABLE NANCY A. KEENAN MONTANA HOUSE OF REPRESENTATIVES
777	HONORABLE TED SCHWINDEN STATE OF MONTANA OFFICE OF THE GOVERNOR

LOCAL AGENCIES
LOCAL ELECTED

NO.	AGENCY/OFFICIAL
339	BOB MOUNTAIN, VICE CHAIRMAN BEAVERHEAD COUNTY PLANNING BOARD
171	MARIE MCALEAR, COMMISSIONER MADISON COUNTY COMMISSIONERS
16	JAMES A. SMITH, SUPERINTENDENT OFFICE OF THE SUPERINTENDENT OF SCHOOLS SALMON, IDAHO - DISTRICT NO. 291

ORGANIZATIONS

NO.	NAME
619	JANET DECKER-HESS, PRESIDENT AMERICAN FISHERIES SOCIETY
26/745	CLIFTON R. MERRITT, EXECUTIVE DIRECTOR AMERICAN WILDERNESS ALLIANCE
313/200	CHRIS MARCHION, PRESIDENT ANACONDA SPORTSMEN'S CLUB
394	KEVIN B. ELLIOTT, PRESIDENT AUDUBON SOCIETY - PINTLAR
264/200	AL LUEBECK, CHAIRMAN BEAVERHEAD FOREST CONCERNED CITIZENS
200	BIG HOLE RIVER WATERSHED COALITION (5)

The numbers in parentheses are the number of signatures on the Comment.

TABLE VI-3 (continued)

ORGANIZATIONS

NO.	NAME
201	SHARON L. MACARTY (121) BIG HOLE RIVER WATERSHED COALITION
48	DARYLL JACOBSON, PRESIDENT BIG HOLE SNOWMOBILE CLUB
270	VAN S. STALLMAN BUFFALO ROAD MUZZLELOADERS
79	JAMES R. WOLF, DIRECTOR CONTINENTAL DIVIDE TRAIL SOCIETY
215	HANK FISCHER, NORTHERN ROCKIES REPRESENTATIVE DEFENDERS OF WILDLIFE
167	RENE' MARINO (2) FLATHEAD COALITION
454	BOB ANDERSON, EXECUTIVE DIRECTOR GREATER YELLOWSTONE COALITION
95	CRAIG GEHRKE, PUBLIC LANDS COORDINATOR IDAHO CONSERVATION LEAGUE
28	ALAN R. HAUSRATH, PRESIDENT IDAHO ENVIRONMENTAL COUNCIL
654	THOMAS M. HEINTZ, PRESIDENT MADISON GALLATIN ALLIANCE
776	DR. JAMES BROGGER, PRESIDENT (2) MISSION VALLEY BACKCOUNTRY HORSEMEN
614	ROBERT M. BALLOU MONTANA AUDUBON COUNCIL
624	EILEEN F. DAMONE MONTANA BOWHUNTERS ASSOCIATION
2	ALAN L. STANFILL, ARCHAEOLOGIST/ANTHROPOLOGIST MONTANA HISTORICAL SOCIETY
8	DORIS MILNER, BITTERROOT NF REP MONTANA WILDERNESS ASSOCIATION
616	ELAINE SNYDER, VICE PRESIDENT MONTANA WILDERNESS ASSOCIATION

ORGANIZATIONS

NO.	NAME
721/780 811	DICK TENNEY, PRESIDENT MONTANA WILDERNESS ASSOCIATION
728	JIM E. RICHARD, CHAIRMAN MONTANA WILDLANDS COALITION
749	KEN FRAZIER, PRESIDENT MONTANA WILDLIFE FEDERATION
730	SHIRLEY MAYDOLE, PRESIDENT BITTERROOT CHAPTER MONTANA WOMEN IN TIMBER
320	ROBERT K. TURNER, REGIONAL VICE PRESIDENT NATIONAL AUDUBON SOCIETY
744	THOMAS M. FRANCE NATIONAL WILDLIFE FEDERATION
781	JOAN BIRD, MONTANA PROTECTION PLANNER THE NATURE CONSERVANCY
274	REM KOHRT OUTDOORS UNLIMITED, INC.
22	RALPH MAUGHAN, CONSERVATION CHAIRMAN SIERRA CLUB - EASTERN IDAHO GROUP
212/200 743	TONY SCHOONEN, PRESIDENT SKYLINE SPORTSMEN'S ASSOCIATION, INC.
143	ROBERT L. HERBST, EXECUTIVE DIRECTOR TROUT UNLIMITED
362/200	JOHN S. MILLER, PRESIDENT GEORGE GRANT CHAPTER TROUT UNLIMITED
640	DOUGLAS E. McCLELLAND, PRESIDENT MADISON - GALLATIN CHAPTER TROUT UNLIMITED
743	RAY PRILL, PRESIDENT (2) WEST SLOPE CHAPTER TROUT UNLIMITED
138	HAROLD H. & RUTH L. BURGESS (2) THE TRUMPETER SWAN SOCIETY

TABLE VI-3 (continued)

ORGANIZATIONS

NO.	NAME
742	PETER D. COPPELMAN, SENIOR COUNSEL (2) THE WILDERNESS SOCIETY
115	DANIEL A. POOLE, PRESIDENT WILDLIFE MANAGEMENT INSTITUTE
726	PAUL M. OLSON, SECRETARY/TREASURER WISE RIVER JACKPINE SAVAGES SNOWMOBILE CLUB

BUSINESS/INDUSTRY

NO.	NAME
97	JAMES W. WELCH ARROW RANCH
194	JACK ATCHESON JACK ATCHESON & SONS, INC.
779	KEITH ATCHESON JACK ATCHESON & SONS, INC.
62	BILL HENSON ATKINS MINING & EXPLORATION INC.
722	W.G. GILBERT, III ATTORNEY AT LAW
653	JAMES A. HAYNES ATTORNEY AT LAW
149	HERBERT J. AVRUTIS, M.D.
642	NATHAN BORSON BIG SKY OF MONTANA
607	MICHAEL C. KOSSOW BLUE HERON GUIDE SERVICE
159	MARTIN WEEKS BOGUE, WEEKS & RUSCH
729	STUART F. LEWIN BOULDER HOT SPRINGS
165	RICHARD D. TENNEY, M.D. BOZEMAN INTERNAL MEDICINE ASSOC.

BUSINESS/INDUSTRY

NO.	NAME
753	JOE MANNING, VICE PRESIDENT CHAMBER OF COMMERCE (ENNIS)
348	JAMES E. BENTLEY, LOGGING AND PROCUREMENT MANAGER CHAMPION INTERNATIONAL CORPORATION
259	PAUL & KATHY CHEESMAN (2) THE CHEESMAN FILM GROUP
19	RICHARD T. HUGHES CHEVRON U.S.A.INC.
733	NORMAN M. CHRISTENSEN, M.D.
645	DAVID DECKER THE COMPLETE FLY FISHER
124	CRAIG SCHEAK CORNUCOPIA DISTRIBUTION
116	HOWARD M. HARLAN CYPRUS MINES CORPORATION
90	DELBROCK LICHTENBERG DELBROCK CATTLE CO.
271	VAN STALLMAN DENO CREEK TRADING
799	TED P. ODMARK DOUBLE FORK RANCH
256	J. A. DUSING, M.D.
196	CAROLYN MEYER EAGLE FORK FARM
630	JOEL A. SHOUSE P.E. ENGINEERING, PLANNING, MANAGEMENT AND ENVIRONMENTAL CONSULTING SERVICES
186/821	EDWARD C. SARGENT, M.D. FAIRFIELD MEDICAL CLINIC, P.C.
221	MICHAEL LYNGHOLM, WOODS MANAGER F.H. STOLTZE LAND & LUMBER CO.
366	ROYCE SATTERLEE, GENERAL MANAGER F.H. STOLTZE LAND & LUMBER CO.

TABLE VI-3 (continued)

BUSINESS/INDUSTRY

NO.	NAME
340	JOHN A. ULRICH, FORESTER F. H. STOLTZE LAND & LUMBER CO.
155	GEORGE F. COSTELLO FLYING ARROW RANCH
241	EDWARD C. FOSS, M.D.
332	JONAH S. FREEDMAN, M.D.
38	BRUCE HELMING HELMING & SONS, INC.
401	JACK HIRSCHY (2) HIRSCHY LIVESTOCK, INC.
644	FAYE F. HOLLAND, SECRETARY HOLLAND RANCH CO.
720	M.L. NIELSEN, MANAGER, MINERAL RESOURCES IDAHO ENERGY RESOURCES CO.
775	BRUCE H. DUNN, DIVISION FORESTER IDAHO STUD MILL
146	JOHN C. RICH IDS/AMERICAN EXPRESS INC.
757	WAYNE W. LUDEMAN, DIRECTOR TIMBER SUPPLY & PRIVATE FORESTRY INLAND FOREST RESOURCE COUNCIL
453	RICHARD G. REID, EXECUTIVE VICE PRESIDENT INLAND FOREST RESOURCE COUNCIL
612	JOSEPH URBANI, FISHERIES BIOLOGIST INTER-FLUVE, INC.
111	JAMES R. COLLINS, JR. LAKEVIEW GUEST RANCH
298	PAUL L. FRETER LEWIS, OVERBECK & FURMAN LAW OFFICES
305	ROBERT SCHAAP LONE MOUNTAIN RANCH

BUSINESS/INDUSTRY

NO.	NAME
344	BRADLEY G. PENN, LAND/ENVIRONMENTAL COORDINATOR MARATHON OIL COMPANY
727	BARRY COHEN MARIAH SOUND COMPANY
33	D. M. SPRAGUE MONTANA POWER COMPANY
289	STUART H. DOGGETT, PUBLIC LANDS COORDINATOR MONTANA PUBLIC LANDS COUNCIL
188/291	MATT URICK MOOSE CREEK RANCH
329	PAT CONNELL NEVILLE'S LOG HOMES
128	WILLIAM B. HORN NEWLAND, HORN, CRIPPEN & PECK, P.C.
207	CHARLES BAGLEY, M.D. NORTHWEST CANCER CENTER
44	J. MICHAEL PADDOCK PADDOCK LOGGING
228	MARK F. ROTAR, M.D. PARKSIDE PROFESSIONAL VILLAGE
311	TIMOTHY E. MAGNESS PINTLAR PACKERS
168	JUDY A. BARKER PLUMCREEK TIMBER COMPANY, INC.
160	NEAL ROGERS, M.D.
626	DERRIANE P. SARGENT SARGENT RANCH
166	DAVID A. REPOLA, M.D. ST JAMES COMMUNITY HOSPITAL
109	LOWELL J. SCHELLACK SCHELLACK ENGINEERING & ASSOC.

TABLE VI-3 (continued)

BUSINESS/INDUSTRY

NO.	NAME
824	JEAN M. MATTSON SEATTLE PUPPETORY THEATRE
756	LEE JOHNSON, SECRETARY SNOWLINE GRAZING ASSOCIATION
651	E. G. WERREN, OPERATIONS MANAGER SOHIO PETROLEUM COMPANY
400/401	J.B. ANDERSON SOUTHWESTERN MONTANA STOCKMEN'S ASSOC.
250	WILLIAM B. SMITH SMITH, SMITH & TAYLOR, ATTORNEYS AT LAW
293	GARY RICHARDSON STOCKTON OUTFITTERS
297	NEVIN STEVENSON STOCKTON OUTFITTERS
150	BILLY STOCKTON STOCKTON OUTFITTERS
275	REM KOHRT STOLTZE-CONNER LUMBER CO.
198	JAN & LES DAVIS (2) SUNDANCE LODGE MONTANA
52	GEORGE W. THOMAS THOMAS BROS
50	ROY THOMAS THOMAS BROS
767	JOHN A. NAISBITT TOBACCO ROOT RANCH CO.
443	H. TRIPPLEHORN, M.D.
312	ROBERT O. BYRON TRUE OIL COMPANY
255	STEVE GOSS U.S. BORAX
73	ROBERT C. BISHOP VAL-DESTA MINES & MINERALS

BUSINESS/INDUSTRY

NO.	NAME
361	LOGAN & SALLY SCHENDEL (2) WALL CREEK OUTFITTERS
723	MIKE MICONE, EXECUTIVE DIRECTOR WESTERN ENVIRONMENTAL TRADE ASSOCIATION
280	DOUGLAS WEBBER, M.D. WESTERN MONTANA EMERGENCY PHYSICIANS
303	LEE STRONCEK WILDLIFE, SPORTING & LANDSCAPE ART
56	BOB WILKE WILKE BROS SAWMILL
53	JOHN F. WILKE WILKE BROS SAWMILL
180	DAVID W. WILLIAMS, M.D. (2)

INDIVIDUALS

NO.	NAME
482	KATHY AHLENSLAGER
216	DAVID ALBERSWERTH
601	GENE ALBERT
675	SIRI ALBIN
177	GEORGE V. ALLEN, JR.
238	JANET R. ALLISON, Ph.D.
184	ART ANDERSEN
517	GEORGE ANDERSON
462/528	PATRICK G. ANDRE
251	STEVE ANTONIOLI
686	LINDA ARLAND
613	W.M. & ELIZABETH ARMSTRONG (2)
505	JACKIE ARUSDEN
451	JOHN ASTLE
485/559	JIM ATKINSON
501	MARVIN BACKER
199	ROBERT D. BACON
752	STEPHEN M. BAILEY
14	DENNIS BAIRD
387	BILL BAKEBERG
808	DALE BAKER
316	DARRYL BAKER
147	SUSAN BALDWIN
637	DARCY BALLANTINE

TABLE IV-3 (continued)

INDIVIDUALS

NO.	NAME
58	DR. & MRS. ALAN BARBOUR (2)
515	DIANE BECHARD
72	BARB BECK
658	LYNN & BOB BELL (2)
20	ERROL D. BENCKE
697	KEN BENDER
278	TOM BENEVENTO
805	SUE BENNETT
30	ARTHUR R. BEVAN
422	DEBBIE BIANCHI
593	DONNA J. BIANCHI
584	NATHAN BIANCHI
285	ROBERT E. BIERBAUM
78	BERTHA BIKULCS
326	JOAN M. BIRCH
704	BILL BISHOP
762	TAMARA R. BLACK
570	DAN BLOCK
724	DANIEL G. BLOCK
571	SUSAN BLOCK
426	MATT BOKA
758	JON BONNICKSEN
549	RANDY BORNIGER
342	MICHAEL E. BOYD
405	JOHN BRIGGS
576	JANINE BROCKWAY
145	B. THOMAS BROOKE
734	CATHERINE P. BROWMAN
263	PHILIP S. BROWN
771	TERRI BROWNELL
163	DALE BRYANT
556	SHERRI BRYANT
249	TOM BUGNI
587	GARY A. BUJOK
415	KEN BUJOK
477/509	CINDY BURKHARDT
375	KATHY BURKHART
236	MARY ANN BURG
174	ANDREW P. BUTLER
514	CHEYE ANN BUTLER
152	WILLIAM D. CAIN
397	RICHARD CAIZZA
132	JOHN CANAVAN
51	REX CARAKER
562	GARRY J. CARLSON
429	TED R. CARLSON
74	TOM CARROLL
114	MEREDITH E. CASEY
760	XAVIER CEDANO

INDIVIDUALS

NO.	NAME
555	DANIEL CHAON
788	BRADLEY CHASE
766	FLORENCE CHESSIN
769	MEYER CHESSIN, Ph.D.
381	BETH CHRISTENSEN (3)
321	SHIRLEY A. CHRISTENSEN
104	LAWRENCE CHRISTIANSEN
121	JENNIE CHRISTOPHER
118	JOAN M. CHRISTOPHER
122	KATIE CHRISTOPHER
479	ANN MARIE CHYTRA
112	ALICE CLARK
550	GARY CLARK
105	JERRY P. CLARK
523	ANN MARIE CLAYTON
54	MONIE CLEMOW
759	CLARENCE S. COE
457	ARTHUR B. COFFIN
795	CELIA COHEN
237	DAVID COLE
551	MARY COLE
17	GLENN COMPTON
267	ROBERT H. COOMBS
783	JEROME & YVONNE COOPMANS
522	SALENA COPPEY
130	JOE CORYELL
7	LARRY L. CORYELL
494	JIM COURTNEY
399	MARJORIE COK
398	ROGER E. COK
665	MICHAEL CRAIG
144	MALINEE CRAPSEY
372	JOHN CRAWFORD
682	TOM CRAWFORD
351	MARTRE CRONE
36	JEFFREY CROOK
261	BILL CUNNINGHAM
440	KARL CUPP
359	JAMES F. CURTIS
404	DAN CYPHER
595	JAMES R. D'ADDEZIO
731	GREG DANELZ
602	DOYLE M. DAVIS
442	ERIC DAVIS
597	NIGEL DAVIS
141	CHARLES E. DAVIS, JR.
638	HELEN H. DAY
333	KAREN DE BRAAL
169	PHIL DEAN

TABLE IV-3 (continued)

INDIVIDUALS

NO.	NAME
787	WILLOW DEAN
611	JANET DECKER-HESS
586	DENNIS A. DELANO
158	HELEN S. DEMAREE
410	JEFF L. DEMPSEY
711	V. DERSAM
592	RANDY DICKEY
700	SHARON DICKINSON
491	LYNNE DICKMAN
685	STEPHEN DICOMITIS
129	DENNIS DIRCKY
206	DENNIS DOHERTY
66	DANIEL M. DOLAN
773	MAC DONOFRIO
605	JIM DOOLITTLE
61	DON DRAKE
718	MARGARITA DRITSHULAS
222	THELMA C. DU VINAGE
561	FRANK DUGAN
657	CARL DUNKERSON, JR.
15	PHIL S. DUVAL
502	LYNN D. ECK
252	HERSCHEL A. ELARTH
782	STEPHEN M. ELFELT
790	DR. K.A. ELLIOTT
76	LESTER J. ELSE
139	JAMES H. EMERSON
770	CELESTE G. ENGEL
648	KIRBY C. & PAMELA ERICKSON (2)
414	RAY ERICKSON
395	CLYDE H. ERIKSEN
503	JULIA ERVIN
610	DON A. ESSIG
487	RON EWART
622	WILLIAM J. & MARGARET FAUST (2)
195	TIM FAY
717	BILL FELLOWS
84	DON RED FERN
738	MARK T. FIEGE
137	G. V. FISCHER
162	MATT FISCHER
754	GARRY D. FLAVELL
432	KELLY FLYNN
445	EDWARD M. FOLEY
232	LOREEN FOLSOM
797	ART FORAN
393	SHARON FORD
380	THOMAS A. FORD
817	DICK FOREHAND

INDIVIDUALS

NO.	NAME
660	SUSAN FORMAN
655	DOUGLAS L. FORREST
664	JULIE FOSBENDER
633	JACKIE FOSTER
701	JOHN FRANCIS
408	VINCE L. FRIESZ
710	KELLY FULLNER
437	GABRIEL R. GAGNER
548	PAT GALLUS
604	JOHN GARCIA
59	RUTH GARDNER
676	MONIE GARNETT
825	THOMAS GEARY JR.
273	DAVID L. GENTLER
750	THOMAS H. GIBSON
295	ROLAND A. GLASS
683	TAMERA L. GLASSCOCK
231	RACHEL GLAZER
373	RONALD J. GLOVAN
385	HARRY & LOIS GOLDMAN (2)
258	KEN GOLDSMITH
476	DAVID T. GOODHART, JR.
560	BETTY GRAHAM
117	JIM G. GRANGER, JR.
224	HARRY GROSE
772	ANTHONY D. GROSSO
262	NORMAN GUAY
714	JAMES GURLEY
369	ANN M.T. GUTHALS
553	CHUCK GUY
804	DAVID A. HADDEN
334	TOM HAHN
470/504	KAREN HALL
210	G. HAMBURGER
669	ANNE HAMILTON
390	DAVID J. HAMMONS
590	MIKE HAMPTON
713	JOHN J. HANSEN
652	RALPH HANSON
310	BERNARD J. HARKNESS
309	MR. & MRS. BERNARD HARKNESS (2)
510	COLLEEN HARRINGTON
318	BESS HARRIS
391	DAVID B. HARTWELL
424	MARK HATFIELD
70	TALLY HAYDEN
793	CHRIS HEINTZ
739	MADONNA L. HELLYER
823	MARIEL HEMINGWAY

TABLE IV-3 (continued)

INDIVIDUALS

NO.	NAME
308	JOANNA HEMMAT
709	LUCINDA HEMRY
677	DANIEL HENWOOD
363	BERTHA HERZOG
623	J. A. HERZOG
352	JIM HERZOG
349	JOE HERZOG
383	MARY ANNE HERZOG
358	MAUREEN HERZOG
377	MIKE HERZOG
182	LAURA E. HILBY
643	BILL HILL
403	BRIAN L. HOCKETT
546	CHRIS HOFF
89	STEVE HOLDORF
99	MARY LOU HOLTHAUS
609	ALBERT E. HONICAN
463	PATTY HOSEA
23	DALE HOTH
493	VALERIE HOUGH
71	ELAINE HOWARD
579	LOUIS E. HOWE
568	RAMONA HOWE
668	STEVE HOWE
389	CONNIE J. HUBBARD
598	DOUG HUBBARD
656	SCOTT HUFFIELD
220	FRANK E. HULL
534	SHANNON HUNT
519	BETSEY HURD
417	BOB IRVINE
279	DON B. JACKSON
40	MARTIN JACKSON
229	REUEL G. JANSON
13	JERRY JAYNE
796	JOANNA L. JOHNSON
301	KEN JOHNSON
679	LARRY M. JOHNSON
694	LORI J. JOHNSON
10	ORLO JOHNSON
292	PAUL A. JOHNSON
438	KATE JOHNSTONE
142	ANNA B. JONES
126/802	CEDRON JONES
21	ROBERT JONES
254	SARA TOUBMAN JONES
235	TERRY JONES
288	LEO P. JORON
578	FRANK JOSEPH

INDIVIDUALS

NO.	NAME
585	ANDREW JUDGE
388	HARRIET A. KARKUT
475	DANA KARUZA
87	PAM KELLER
218	GLENN N. KEMMER
161	FRANCIS A. KENIA
746	JACK KEOGH
107	GEORGE A. KETO
565	DAVID KEYS
211	LEON L. KIND
277	DAN KLINGER
29	BRENT KNAPP
325	RUTH M. KOCH
24	M. J. KRAMIS
606	PEGGY KRAUS KENNEDY
153	CONNIE KRAUTTER
599	ANDREW KUCHTYN
336	RICHARD A. KUHL
678	THOMAS KUHN
85	JAMES L. KUJALA
699	REBECCA LACY
106	DOROTHY LADDISH
667	ROBYN LAMOREAUX
536	LAURA LANFEAR
809	M. LANGENDERFER
472	MARGARET LANGLEY
81	MAX LAPHAM
431	PHIL LAWRENCE
47	RICH LAWSON
547	STEVEN LEASH
185	PETER O. LEDONNE, JR.
242	BONNIE R. LEIFER
94	SHANNON LEMOINE
516	RICHARD LEVESQUE
452	CINDY LEWIS
302	LARRY LEWIS
226	ROGER W. LEWIS
639	LON LINDROTH
392	DAVID LINE
819	CHARLENE LOCKE
596	LEON D. LOGAN
736	CHARLENE LOGE
567	STEVE LOKEN
319	KENNETH M. LOUCKS
335	PATRICE LOUCKS
376	MARY E. LOVERIDGE
136	RON LOWNEY
474	MARK LUCURZ
434	STEVE LUEBECK

TABLE IV-3 (continued)

INDIVIDUALS

NO.	NAME
360	JOHN R. LUNDBORG
535	CAROL LYNCH
300	MIRIAM I. LYNGHOLM
500	JERRY MACKIE
91	MARK MACKIN
148	R. P. MADISON
133	BEVERLY MAGLEY
213	DAVID A. MAKI
689	ANDREW COLE MALING
577	JAMES R. MALTSEY
785	JOE MARINO
219	ROGER MARKER
594	SHONA JO MARKER
131	PHILIP C. MARNE (3)
156	JOEL MARSHIK
244	DAN MARTIN
735	DAVID P. MARTIN
345	STEVEN R. MARTIN
641	BYRON MARTINELL
636	KATHLEEN MARTINELL
192	PHILIP A. MASON
93	JACK C. MAUER
755	DAN McCAFFERY
680	PATRICK J. McCORMICK
763	PAT McCOY
764	STEVE McCOY
287	BOB McCREADY
102	SHERRY & BOB McDONALD (2)
807	SUSAN McDOUGAL
778	GRAEME R. McDOUGAL
803	RICHARD A. McINTYRE (2)
209	BOB McKAY
18	TOM McKAY
695	MARC McLAMEY
120/307	DANA McMURRAY
465	
253	CHRIS McNEILL
322	KIM McNEILL
725	RICHARD M. & BONNIE H. McNINCH (2)
296	A. T. McQUEEN
294	W. L. McQUEEN
382	MIKE MEE
357	RICHARD R. MEIS
671	JAMES MENAKIS
583	ROGER MERRITT
538	WAYNE T. MEUCHEL
574	SUSAN MILES BRYAN
818	BETH MILLER
65	JOHN S. MILLER

INDIVIDUALS

NO.	NAME
552	LARRY R. MILLER
460	LAWRENCE MILLER
531	MARGARET MILLER
5	ROY MILLER
620	FRED MISSBUECHLER
197	GATLIN MITCHELL
243	GREG MLADENKA
647	JOHN E. MOEUR, Ph.D.
468/564	DIANA MOFFEIT
497	PAT MOHAN
266	PEYTON MONCURE
233	EDWARD C. MONNIG
801	AMY MONTEITH
539	PAUL MONTGOMERY
715	CHRIS MONYA
140	BLAINE MOOERS
544	TRACY MOORE
698	VINA MOORE
511	THOMAS A. MORARRE
123	BROOKE MOREHOUSE
740	SHARON J. MOREHOUSE
737	STEPHEN MOREHOUSE
86	DEVVI MORGAN
178	DR. CAROLYN R. MORILLO
125	DOROTHY MORRIS (13)
411	CHARLES M. MORT
649	KAREN GAIL MOSHER
189	MIKE MOSOLF
747	JOAN & HELEN MOYLE (2)
260	ROBERT F. MUELLER
68	WES MULLANEY
670	SHARON A. MYERS
483/661	SARAH MYSLIS
527	M. STEVEN NADEAU
338	LORNA NAEGELE
525	CHARLENE NELSON
588	FREDERICK R. NELSON
43	JAY NELSON
83	JOHN T. NELSON
520	MIKE NELSON
42	ROBERT R. NELSON
379	JERRY O. NICHOLLS
341	LISA NICHOLLS
113	RALPH NICHOLS
25	E. TERRILL NOBLES
127	THE REV. STEPHEN NORCROSS
175	KATHERINE NORDSIECK
449	ABBOTT L. NORRIS
450	JACKY NORRIS

TABLE IV-3 (continued)

INDIVIDUALS

NO.	NAME
631	NICK NOVICH
569	RUTH NYMAN
621	KEVIN O'BRIEN
542	K. O'CONNOR
225	LUCY OLD
703	DIANE OLHOEFT
537	BRIAN OLSON
666	MICHELLE OLSON
810	DAVID ORNDOFF
589	CHARLES L. OSBORN
282	ROBERT OSET
632	DEBI M. OTTINGER
324	DANA L. OVIATT
629	THOMAS H. OWEN (7)
134	DUSTY OWENS
355	CHARLES M. PADEN
181	LAWRENCE A. PAPP
412	JERRY PATRICK
327	WILLIAM PATRICK
420	HARLIE L. PATTERSON
663	C.B. PEARSON
784	BARB & JIM PETERSEN
691	ANDREA PETERSON
41	HAROLD PETERSON
4	TOM PETRILLO
328	MARK PETRITZ
170	CLARENCE PETTY
247/370	JAMES PHELPS
572	TASHIKO PILETTA
478	ANDREW PILSKALNS
521	LOREN PINSKI
374	ERIC L. PLATT
518	TIM PLENGER
512	DAVID J. PLUMMER
407	JIM PLUTT
406	JOHN P. PLUTT
524	JOHN POLISAR
441	TOM POMROY
815	RACHEL & JACK POTTER (2)
246	ELIZABETH PRATHER
628	JOHN PRESTON
495	LYNN M. PRICE
63	RICHARD A. PRODGERS
765	CRIS PRUITT
3	ALLAN PURCELL
492	JONATHAN QUALBEN
217	DORIS RAPH
448/625	GARY J. RAY
530	NANCY RAY

INDIVIDUALS

NO.	NAME
608	MICHAEL L. RAYMOND
69	LEONARD J. READICKER
179	GEORGE B. REBICH
268/471	SAMUEL A. REID
692	SUZANNE REID
634	BARRY REISWIG
687	JACQUELINE RHODES
435	MICHELLE RICE
384	PAUL RICHARDS
191	GAIL RICHARDSON
428	GARY RILEY
347	CARLA RISTER
421	BLAKE ROBBINS
646	DEXTER M. ROBERTS
183	HADLEY B. ROBERTS
286	ROGER ROBISON
75	JOY M. ROCKWOOD
447	JOHN ROLANDO
202	GARY ROOT
603	MARY LOU ROSCZYK
172	DR. ROGER ROSENTRETER
281	NOEL ROSETTA
575	SUZANNE ROULLIER
57	D. G. RUDE
446	KEN RUNNION
39/317	CHARLES M. RUZICKA
239	DAVID J. RYAN
459/674	RICK RYAN
806	WAYNE H. RYAN
566	GRETCHEN L. RYZ
696	ELOISE SAGMILLER
433	THOMAS SATTERTHWAITE
331/705	STEPHEN SAX
615/732	CLAUDIA SCHAEFFER
702	MARILYN SCHAFER
314	DARRELL SCHARF
526	PAT SCHARFE
135	TODD SCHMIDT
60	CHRISTOPHER & VERONICA SCHMITT (2)
467	DAVID M. SCHMITT
708	JENNIFER SCHOLES
396	BOB SCHONSBURG (3)
684	ANTHONY A. SCHOONEN
581	MARGARET SCHOONEN
558	MARGARET V. SCHOONEN
157	TONY SCHOONEN
37	JOSEPH C. SCHOTT
822	DUANE SCHWECKE
617	PAT SCOWN

TABLE IV-3 (continued)

INDIVIDUALS

NO.	NAME
343	CHRISTINE SEASHORE
543	MARGIE SECCOMB
378	TERRY SEE
208	BILL SEMMENS
248	DAN SEMMENS
205	JOHN SEMMENS
214	MARK SEMMENS
204	PAULINE E. SEMMENS
276	TOM R. SEWELL
430	ROBERT L. SEXTON
573	ED SHEPARDSON
481	KIM SHERWOOD
681	JEFF SHIPPEE
532	MICHAEL L. SHUBBERT
486/529	PAULA SHULMAN
469	SIGNATURE UNDECIPHERABLE
580	SIGNATURE UNDECIPHERABLE
712	SIGNATURE UNDECIPHERABLE
330	ENA SIMPSON
103	ROBERT SITZ
591	JIM SIVILS
707	MARY R. SLAMA
265	ANDY SMITH
541	BARRY SMITH
315	E. MAYNARD & HOLLEY SMITH (2)
257	ERNEST JOHN SMITH
354	JEFFREY J. SMITH
563	JUDY SMITH
690	KATHLEEN F. SMITH
461	LINDA SMITH
688	PAUL R. SMITH
820	R. E. SMITH
693	CAROL SNYDER
234	PAUL SNYDER
67/356	RICHARD SOLUM
786	CARRIE M. SOOD
490/618	E. CARROLL SPECK
306	TIMOTHY SPEYER
423	DON STALEY
488	PETER STALTZ
496	JIM STAMMERS
659	MARTHA STAMMERS
245	BARRY STAMP
173	BRAD STANBACK
498	JAMES STANKO
480	STEVE W. STATHAKY
269	BARBARA STEELE
55	DAN R. STEVENSON
499	KALMAR R. STEVENSON
774	MR. & MRS. RICHARD C. STEVENSON (2)
367	DAVID R. STEWART
672	RON STIRLING
272	WILLIAM J. STOLTENBERG
154	JIM STOLTZ
368	KENNETH STOLZ
791	CLARISSA STOUT
673	BRIAN G. STRICKER
203	DANIEL J. STRIZIC
464/545	TONI R. STRONG
425	CHERYL T. STRUPP
418	RANDY STRUPP
323	JILL STYERS
119/227	BERTHA M. SULLIVAN
812	GEORGE SULLIVAN
706	JOANNE M. SUTTON
80	JOHN R. SWANSON
223	DR. WILLIAM E. SWIFT
350	W. JAPE TAYLOR
458/662	MATT THOMAS
751	TRACI THOMAS
800	WILLIAM A. THOMAS
284	LISA & KIRK THOMPSON (2)
484/506	HEATHER TODD
554	RICHARD TORRE
513	ANN M. TRACY
240	JOHN & SALLY TRAUSCHT
49	LARRY TUCKER
353	JONATHAN TURK, Ph.D
6	UNSIGNED
600	UNSIGNED
46	UNSIGNED
64	UNSIGNED
409	JAMES J. VALACH
540	W. S. VAN SICKLE
792	CARL VAN VALKONBURG
299	NANCY & MICHAEL TERRAMIN (2)
304	KEVIN VAUGHN
444	BRUCE VON ALTEN
290	PATRICIA VON ALTEN
768	HARVEY VUCASOVICH
402	PETER WAKEMAN
582	KEVIN WALLACE
716	ROSE ANNE WASTJER
364	MARK WATKINS
761	CATHY WEBER
193/816	DAN WEINSTOIN
337	ALLEN WELLS
427	CATHY WELLS

TABLE IV-3 (continued)

INDIVIDUALS

NO.	NAME
533	LINDA WESSEL HEAD
627	MIKE WEST
283	GREGG R. & WENDY L. WHEELER (2)
489	JAMES B. WHEELIS
439	DAN S. WHERRY
508	RON WHITE
466/557	GRANT WIEGERT
365	BRUCE WIELINGA
419	MR. & MRS. JOHN WIGEN (2)
416	DALE WILKE
413	ED A. WILKE
386	CARYL WILLIAMS
814	ROLAND WILLIARD
190	DON WILLOUGHS (20)
741	SHARLON WILLOWS
45	CHARLES E. WISSENBACH
436	FRED J.WITT
164	ANN S. WOLFF
507	PATRICK WOOD
748	REVEREND JOHN F. WORD
31	GEORGE WUERTHNER
176	GEORGE E. YAKEL
813	ROSALIND YANISKHEVSKY
230	TENNIE YODER
456	MICHAEL YOST
455	SALLY YOST
635	LARRY G. YOUNG
789	MICHELLE A. YOUNG
650	HUGH ZACKHEIM
473	JOHN ZELAZNY
187	E-AN ZEN
346	PAUL M. ZENK
110	ALAN G. ZETLER
794	CHRISTINE ZICH
35	*
88	*
92	*
96	*
101	*

* Not included in the analysis because it is a request for more time or the letter did not pertain to the Forest Plan.

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[*] This "Index" is provided to the reader as a subject reference for the material in the following comments and responses. The intent was to incorporate the major points raised in the individual comments into a more concise listing. There is no intention to provide a complete index of the issues raised by the commenters. No attempt should be made to analyze the "importance" of a given subject from the number of comments indexed to it.

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Quality
21,23,26,31,65,83,94,95,97,104,107,113,117,136,139,142,146,147,152,153,156,157,159,165,166,167,169,172,174,178,181,186,189,191,192,195,196,200,201,202,203,204,210,215,216,218,226,243,244,,247,248,250,251,252,254,256,257,261,262,264,276,277,278,279,280,281,286,297,299,302,304,306,307,308,310,311,314,316,317,318,319,321,324,325,329,335,337,338,351,354,357,359,369,371,373,380,381,384,387,388,393,395,396,401,414,428,429,430,431,432,433,434,435,436,437,438,439,440,441,442,443,444,445,446,447,448,449,450,451,452,453,454,455,456,461,463,464,465,466,467,468,469,470,471,472,473,475,476,477,478,481,482,483,485,486,488,489,490,491,482,793,494,495,496,497,498,499,500,501,502,503,504,505,506,507,508,509,510,511,512,513,514,515,516,517,518,519,520,521,522,523,524,525,526,527,528,529,530,531,532,533,534,535,536,537,538,539,540,541,542,543,544,545,546,547,548,549,550,551,552,553,554,555,556,557,558,559,560,561,562,563,564,565,566,567,568,569,570,571,572,573,574,575,576,577,578,579,580,581,593,596,605,606,607,610,615,618,619,325,627,629,630,631,633,640,642,643,645,648,649,650,654,655,658,659,660,661,662,663,664,665,666,667,668,669,670,671,672,673,674,675,676,677,678,679,680,681,682,683,684,685,686,687,688,689,690,691,692,693,

694,695,696,697,698,699,700,701,702,703,704,705,706,707,708,709,710,711,712,713,714,715,716,717,718,721,724,728,735,736,737,738,739,740,743,744,745,749,758,760,761,762,763,764,765,766,767,768,770,771,772,774,777

Timing of Runoff

31,91,93,95,104,113,136,152,157,195,200,201,203,208,212,329,336,351,357,359,396,605,618,619,620,630,640,645,654,658,721,724,743,744,767 770,

Wilderness

Support for

8,31,37,39,40,41,57,59,63,64,65,80,89,94,95,106,110,111,115,126,127,128,134,136,137,140,154,157,170,171,172,187,189,191,192,193,195,200,207,209,223,231,252,254,256,260,262,263,264,269,270,271,272,273,279,283,284,285,290,305,319,321,322,325,327,333,335,336,338,342,350,351,354,355,359,364,372,373,375,380,384,385,386,387,389,394,395,401,402,428,429,430,431,432,433,434,435,436,437,438,439,440,441,442,443,444,445,446,447,448,449,450,451,452,454,459,460,461,462,463,464,466,467,468,469,470,471,472,473,475,476,477,478,480,481,482,483,484,485,486,487,488,489,490,491,492,493,494,495,496,497,498,499,500,501,502,503,504,505,506,507,508,509,510,511,512,513,514,515,516,517,518,519,520,521,522,523,524,525,526,527,528,529,530,531,532,533,534,535,536,537,538,539,540,541,542,543,544,545,546,547,548,549,550,551,552,553,554,555,556,557,558,559,560,561,562,563,564,565,566,567,568,569,570,571,572,573,574,575,576,577,578,579,580,581,596,603,605,609,610,611,615,619,620,627,628,631,633,637,642,643,649,650,653,655,659,660,661,662,663,664,665,666,667,668,669,670,671,672,673,674,675,676,677,678,679,680,681,682,683,684,685,686,687,688,689,690,691,692,693,694,695,696,697,698,699,700,701,702,703,704,705,706,707,708,709,710,711,712,713,714,715,716,717,723,726,727,729,735,736,737,738,739,740,745,758,760,761,762,763,764,765,766,767,768,771,773,777

Opposition to

3,5,10,13,16,33,42,43,44,46,47,48,49,51,51,52,53,54,55,56,76,83,104,109,116,141,171,183,213,255,270,274,275,292,304,310,315,338,339,340,366,378,396,397,399,405,410,412,416,418,419,420,424,425,426,453,583,584,585,587,588,589,590,591,593,594,597,598,599,602,604,635,636,641,644,651,652,657,658,719,730,750,754

Conservationists' Alternative

210,226,227,228,229,230,231,232,233,234,235,236,237,238,239,240,241,242,265,266,267,268,288,326,331,332,341,346,347,365,368,378,569,608,621,632,616,731,748,755

Other Recommendations 62,67,95,104,116,165,272,

Wildlife

Elk

7,,13,16,18,20,21,23,24,26,29,31,37,40,41,42,43,44,46,47,48,49,50,52,53,54,55,56,57,59,61,63,65,69,76,80,83,81,85,89,93,94,95,104,105,106,107,108,109,110,111,112,115,116,117,126,127,128,134,136,137,141,148,150,152,154,155,156,162,165,166,169,171,179,183,200,202,206,208,209,212,213,215,219,225,262,264,269,272,275,276,280,282,287,289,291,292,294,296,297,302,304,309,310,311,313,315,323,327,335,339,340,348,351,357,359,366,378,387,390,395,396,399,400,401,403,405,412,416,418,419,420,424,425,426,428,453,454,462,484,583,584,585,587,588,591,593,594,597,598,599,602,604,609,610,613,615,616,620,635,638,640,641,643,644,650,652,654,657,658,721,722,724,728,730,742,744,745,749,750,751,767,768,772,774,777,

Other Big Game Species
31,20,108,117,183,215,281,291,348,351,359,462,605,615,652,744, 745,749,777
Nongame Species 615,777
Indicator Species 362,391,619,743,744,777
Threatened/Endangered Species
4,10,80,108,165,181,191,256,333,657,384,453,484,618,325,637,659,745,774,777
Species of Special Concern or Interest
31,65,97,105,108,138,200,215,293,297,320,351,357,359,362,370,384,391,394, 395,396,454,457,613,614,615,617,618,619,629,630,640,643,649,732,743,744, 745,772,768,777
Habitat Treatment 108,111,215,245,394,453,652,654,744,767,777
See also, Private Lands/Landowners and Grazing, Management
Wildlife General
10,20,21,26,39,50,53,54,60,65,67,69,72,74,76,80,83,94,95,111,113,116,126, 137,142,145,147,157,159,165,167,174,178,180,181,183,186,189,191,192,194, 195,200,201,212,215,216,218,220,221,244,245,247,250,252,256,257,258,261, 264,273,274,275,277,283,289,290,291,294,299,302,304,305,315,322,324,336, 337,338,340,351,352,357,359,363,364,366,367,374,376,369,375,377,381,382, 384,388,393,394,395,402,403,452,453,454,455,456,461,463,465,484,582,593, 596,605,606,610,615,625,627,634,640,641,643,644,645,648,650,654,659,721, 722,728,742,743,744,756,758,767,768,777

AGENCY AND ELECTED OFFICIAL COMMENTS AND FOREST SERVICE RESPONSE

U.S. Department of Housing and Urban Development
Denver Regional Office, Region VIII
Executive Tower
1405 Curtis Street
Denver, Colorado 80202-2349

REC
85 JAN 17 AM 11 : 00
BEAVERHEAD N.F.
DILLON, MT

1-15-06

January 15, 1985

Mr. Joseph J. Wagenfehr
Forest Supervisor
Beaverhead National Forest
P.O. Box 1258
Dillon, Montana 59725

Dear Mr. Wagenfehr:

Thank you for the opportunity to review and comment on the Beaverhead National Forest Revised Draft Environmental Impact Statement.

Your draft has been reviewed with specific consideration for the areas of responsibility assigned to the U.S. Department of Housing and Urban Development. This review considered the proposal's compatibility with local and regional comprehensive planning and impact on urbanized areas. Within these parameters, we find this document adequate for our purposes.

If you have any questions regarding these comments, please contact Mr. Howard S. Kutzer, Regional Environmental Officer, at (303) 844-3102.

Sincerely,

Robert J. Matuschek
Director
Office of Community Planning
and Development

	SUPERVISOR		ENGINEERING SO
	PLANNING SO		GENERAL
	TMBR PLANNING		PRECONSTR
	RANGE/WLDF SO		CONSTRUCTION
	HYDROLOGY		TRANS PLANNING
	WILDLIFE		ADMIN SO
	GEO/MINING		PERSONNEL
	SOILS		[illegible] & F
	TMBR/REC SO		[illegible]
	SILVICULTURE		SUPPORT SVCS
	TMBR/SALES FIRE		INFO MGT SEC
	LNDSCP/ARCH REC		RESOURCES
	RIGHT-OF-WAY		COPY TO.
	OTHERS:		

United States Department of Agriculture
Forest Service
Beaverhead National Forest
P.O. Box 1258
Dillon, MT 59725
406/683-3900

Reply to: 1920

Date: *

Robert J. Matuschek
Director
Office of Community Planning and Development
U.S. Department of Housing and Urban Development
Denver Regional Office, Region VII
Executive Tower
1405 Curtis Street
Denver, CO 80202-2349

Dear Mr. Matuschek,

We appreciate your taking time to review our proposals.

Sincerely,

Ronald C. Prichard
RONALD C. PRICHARD
Forest Supervisor

9

9-14-11

JAMES A. MC CLURE, IDAHO, CHAIRMAN

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BILL BRADLEY, N.J.

MICHAEL D. HATHAWAY, STAFF DIRECTOR
CHARLES A. TRABANDT, CHIEF COUNSEL
D. MICHAEL HARVEY, CHIEF COUNSEL FOR THE MINORITY

United States Senate
COMMITTEE ON
ENERGY AND NATURAL RESOURCES
WASHINGTON, D.C. 20510

January 24, 1985

Richard T. Hauff
Forest Supervisor
Salmon National Forest
P.O. Box 729
Salmon, Idaho 83467

Dear Dick:

Thank you for sending me the Draft Environmental Impact Statement and the Proposed Forest Plan for the Beaverhead National Forest.

I am sure there will be numerous comments on these recommendations since four of the roadless areas will be included in the Draft Forest Management Plan for the Salmon National Forest. Please keep me informed as work on the Draft Forest Plan progresses.

Thank you again for writing.

Sincerely,

Jim McClure
James A. McClure
United States Senator

McC:bwl

FEB - 4 '85

[illegible] 2/5/85

United States Department of Agriculture
Forest Service
Beaverhead National Forest
P.O. Box 1258
Dillon, MT 59725
406/683-3900

Reply to: 1920

Date:

Honorable James A. McClure
United States Senator
Committee On Energy And Natural Resources
Washington, D.C. 20510

Dear Senator McClure:

In our Record of Decision and Final Forest Plan, we address the wilderness recommendations/nonwilderness designations solely for the lands managed by the Beaverhead National Forest. Recommendations for the Salmon National Forest will be presented in the Final Plan and Record of Decision for that Forest.

In our Final Plan, we are recommending the following areas (contiguous to the Salmon and Targhee National Forests) for wilderness designation:

West Big Hole	55,000 acres
Italian Peak	25,700 acres

The rationale for these wilderness recommendations is discussed in our Record of Decision.

Sincerely,

Ronald C Prichard
RONALD C. PRICHARD
Forest Supervisor

II

11-15-06

Advisory Council On Historic Preservation

The Old Post Office Building
1100 Pennsylvania Avenue, NW, #809
Washington, DC 20004

Reply to: 730 Simms Street, Room 450
Golden, Colorado 80401

RECEIVED
85 FEB 4 AM 11:04
BEAVERHEAD N.F.
DILLON, MT

January 31, 1985

Joseph J. Wagenfehr,
Forest Supervisor
Beaverhead National Forest
U.S. Forest Service
P.O. Box 1258
Dillon, MT 59725

REF: Land and Resource Management Plan for Beaverhead National Forest

Dear Mr. Wagenfehr:

We have received and reviewed the Revised Draft Environmental Impact Statement (DEIS) for the referenced planning effort. On page III-7, this document states that the Forest and adjacent lands possess a rich and important cultural heritage. More than 180 historic and prehistoric sites have been identified within the Forest. On pages IV-12 and IV-13, the DEIS emphasizes provisions for protecting cultural resources from damage due to ground-disturbing activities anticipated by this plan. It should be noted that the integrity of important cultural resources may be jeopardized by many activities other than just those that disturb the surface of the ground. The cultural resource management components of this plan should include careful consideration of measures prescribed to mitigate potential adverse effects on cultural resources resulting from actions proposed or anticipated by the plan. Enclosed is a copy of the Council's Manual of Mitigation Measures, which may be helpful to you and your staff in addressing these matters.

A

B

We look forward to working with you as management planning for Beaverhead National Forest continues. If you have any questions, or if we can provide anything further at this time, please contact Dean Shinn of my staff at 776-2682, an FTS number.

Sincerely,

Robert Fink
Chief, Western Division
of Project Review

Enclosure

☐	SUPERVISOR	☐	ENGINEERING SO
☑	PLANNING SO	☐	GENERAL
☐	TIMBER PLANNING	☐	CONSTR
☐	RANGE WLDF SO	☐	[illegible]
☐	HYDROLOGY	☐	TRANS PLANNING
☐	[illegible]	☐	ADMIN SO
☐	[illegible]	☐	PERSONNEL
☐	SOILS	☐	[illegible]
☐	[illegible] SO	☐	[illegible]
☐	[illegible]	☐	SUPPORT SVCS
☐	[illegible]	☐	INFO MGT SEC
☐	LNDSCP ARCH SEC	☐	RESOURCES
☐	RIGHT-OF-WAY		COPY TO:
	[illegible]		

United States Department of Agriculture | Forest Service | Beaverhead National Forest | P.O. Box 1258
Dillon, MT 59725
406/683-3900

Reply to: 1920

Date: *

Robert Fink
Chief, Western Division of Project Review
Advisory Council On Historic Preservation
The Old Post Office Building
1100 Pennsylvania Avenue, N.W. #809
Washington, D.C. 20004

Dear Mr. Fink,

I appreciate your review of our Revised Draft Environmental Impact Statement and Proposed Forest Plan Supplement. I have addressed the concerns raised in your comments in the paragraphs below. The paragraphs containing your concerns have been "lettered" in your letter; paragraphs addressing those concerns are correspondingly identified below.

A. The Forest Plan ensures management of cultural resources, both prehistoric and historic, to maintain their scientific, social, and historic values. While we recognize that the integrity of cultural resources may be jeopardized by activities other than those which are ground-disturbing, these are less threatening than activities which could destroy the actual site. Thus, Forest-wide Standards indicate that survey activities will focus in areas where specific project activities will result in significant ground disturbance.

It is our intent to focus budget expenditures where impacts are most likely to occur and where the need is most immediate.

B. Mitigation measures include (but are not limited to): recreation development for site management and interpretation, structural range improvements to protect sites from impacts associated with domestic livestock grazing, recommendation to withdraw sites from mineral entry and oil and gas lease stipulations that restrict site occupancy.

Thank you for your interest in our Forest Plan.

Sincerely,

Ronald C Prichard
RONALD C. PRICHARD
Forest Supervisor

12

12-14-C

United States
Department of
Agriculture

Soil
Conservation
Service

Room 345, 304 North 8th Street
Boise, Idaho 83702

RECEIVED
85 FEB 7 A10:58
BEAVERHEAD N.F.
DILLON, MT

January 30, 1985

Forest Supervisor
Beaverhead National Forest
Box 1258
Dillon, Montana 59725

Dear Sir:

We have no comments to make on the Beaverhead National Forest's Revised Draft Environmental Impact Statement and Proposed Forest Plan Supplement.

However, we appreciate the opportunity to make comments.

Stanley N. Hobson
State Conservationist

The Soil Conservation Service
is an agency of the
Department of Agriculture

United States
Department of
Agriculture

Forest
Service

Beaverhead
National Forest

P.O. Box 1258
Dillon, MT 59725
406/683-3900

Reply to: 1920

Date: *

Stanley N. Hobson
State Conservationist
USDA, Soil Conservation Service
Room 345
304 North 8th Street
Boise, Idaho 83702

Dear Mr. Hobson,

We appreciate your review of the Revised Draft Environmental Impact Statement and Proposed Forest Plan Supplement.

Sincerely,

Ronald C. Prichard
RONALD C. PRICHARD
Forest Supervisor

SALMON SCHOOLS

OFFICE OF THE SUPERINTENDENT
DISTRICT NO. 291
P. O. BOX 790
SALMON, IDAHO 83467
208-756-4271
SPECIAL SERVICES
208-756-4553

JAMES A. SMITH Superintendent

16

16-14-07

FEB 11 '85

SUP
IMP 1 2 3 4 5 6
AF 1 2 3 4 5 6
RM 1 2 3 4 5 6
WW 1 2 3 4 5 6
D 1 2 3 4 5 6

cc - Stone
1c - Planning files

February 7, 1985

Mr. Richard Hauff, Forest Supervisor
Salmon National Forest
P.O. Box 729
Salmon, Idaho 83467

Dear Mr. Hauff:

This letter is being sent in regards to opportunity for public comment on the Salmon National Forest/Beaverhead National Forest Revised Draft Environmental Impact Statement and a Proposed Forest Plan Supplement.

As always, the Salmon Schools continue to promote the aspect of multiple use in the Federal land surrounding the Salmon area with control remaining in the hands of the Forest Service. In reviewing the proposals I would like to add I support for the Forest's obvious choice which is Alternative H. **A**

I would also like to recommend a road closure after the logs are removed thus allowing for a lower quality road at less cost to the logger. **B** I would also like to add a comment concerning protection of the range and numbers of AUM's granted to ranchers for cattle, sheep and horse grazing, **C** and I highly recommend the inclusion of back country and roadless titles as opposed to wilderness titles. **D**

I thank you for the opportunity to comment for the support for the community of Salmon and the schools.

For the Board of Trustees,

Jim Smith

James A. Smith
Superintendent

JAS/kc

United States Department of Agriculture | Forest Service | Beaverhead National Forest | P.O. Box 1258
Dillon, MT 59725
406/683-3900

Reply to: 1920

Date: *

James A. Smith
Superintendent
District No. 291
P.O. Box 790
Salmon, Idaho 83467

Dear Mr. Smith:

A. The rationale used by the Regional Forester (Northern Region) in deciding upon the selected alternative for management of the Beaverhead National Forest is presented in the Record of Decision. It is impossible to summarize the rationale here without losing some important content. In brief, however, the management goals for the Beaverhead National Forest emphasize wildlife, fisheries and water quality. Within the standards and land use designations designed to protect and enhance these resource values, other resource uses are emphasized.

B. Beaverhead National Forest Plan Objective "O. Roads" and Forest-wide standards for Roads #2, #3, and #4 respond to this concern.

C. The selected alternative for the Beaverhead National Forest provides approximately 190,000 Animal Unit Months (AUM's) of grazing per year on National Forest land.

D. In the Record of Decision and Final Forest Plan, we address the rationale for wilderness recommendations and nonwilderness designations solely for the lands managed by the Beaverhead National Forest. Recommendations for the Salmon National Forest will be presented in the Final Plan and Record of Decision for that Forest.

We do not use "back country," per se, as a "title." However, our management emphases will retain much of the Beaverhead National Forest in unroaded management.

"Roadless" refers only to land which qualified as roadless under the criteria established in the RARE II process and is carried on our roadless area inventory.

Sincerely,

Ronald C Prichard

RONALD C. PRICHARD
Forest Supervisor

V1-44

27

27-14-08

RECEIVED

85 MAR 4 A10:59

BEAVERHEAD N.F.
DILLON, MT

IDAHO DEPARTMENT OF FISH AND GAME
600 South Walnut • Box 25
Boise • Idaho • 83707

February 28, 1985

Mr. Joe Wagenfehr, Supervisor
Beaverhead National Forest
P. O. Box 1258
Dillon, MT 59725

Re: Beaverhead National Forest Revised DEIS
and Proposed Forest Plan Supplement

Dear Mr. Wagenfehr:

We have reviewed said documents and note that during the re-evaluation process all four Roadless Areas on the Salmon National Forest contiguous with your forest have been recommended for nonwilderness management. The Idaho Fish and Game Commission has recommended that two of these areas, Anderson Mountain (13942) and West Big Hole (13943), be managed as wilderness to protect important wildlife values. The Idaho Department of Fish and Game's preference for management of these two areas would be a nonwilderness/unroaded prescription, something not currently practiced on the Salmon National Forest. We sincerely hope they can implement such an option when they develop the Salmon Forest Plan.

Our second choice would be wilderness classification. As we understand the schedule, the Fish and Game Department has adequate time to determine what the Salmon Forest will propose for these areas prior to your decision becoming final. Because wilderness classification is our second option, we prefer not to take a hard stand now but rather to wait and hope our first option can be met.

As we understand the process, the Salmon National Forest will now evaluate several nonwilderness management options for these roadless areas and choose a preferred alternative. If a nonwilderness/unroaded alternative is chosen, our primary goal of obtaining a management scheme which will provide adequate protection to the important wildlife values in these areas can be satisfied.

Pg. 1 of 2

United States Department of Agriculture | Forest Service | Beaverhead National Forest | P.O. Box 1258
Dillon, MT 59725
406/683-3900

Reply to: 1920

Date: *

Jerry M. Conley
Director
Idaho Department of Fish and Game
600 South Walnut
Box 25
Boise, Idaho 83707

Dear Mr. Conley,

Your comments will be considered as the Salmon National Forest develops their Forest Plan.

We appreciate your review of the Beaverhead National Forest Revised Draft Environmental Impact Statement and Proposed Forest Plan Supplement.

V1-45

Sincerely,

Ronald C. Prichard
RONALD C. PRICHARD
Forest Supervisor

27-14-08

Mr. Joe Wagenfehr, Supervisor
February 28, 1985
Page 2

Thank you for the opportunity to comment on this matter.

Sincerely,

Jerry M. Conley
Director

JMC:CHN:TP:tlv

cc: Richard Hauff, Supervisor
  Salmon National Forest
 U. S. Fish and Wildlife Service
 Program Coordination
 Bureau of Wildlife
 Tom Reinecker, Region 6
 Tom Parker, Salmon Office

Pg. 2 of 2

32

32-15-06

RECEIVED
5 MAR 19 A10:43
BEAVERHEAD N.F.
DILLON, MT

DEPARTMENT OF THE AIR FORCE
AIR FORCE REGIONAL CIVIL ENGINEER CENTRAL REGION
1114 COMMERCE STREET
DALLAS, TEXAS 75242

14 MAR 1985

Mr. Joe Wagenfehr
Forest Supervisor
Beaverhead National Forest
P.O. Box 1258
Dillon, Montana 59725

Dear Mr. Wagenfehr:

Thank you for allowing us the opportunity to review the revised Draft Environmental Impact Statement on Proposed Forest Plan Supplement for the Beaverhead National Forest, Montana.

We continue to express our support of the Forest Service in developing functional management plans for lands under its control. The Air Force concern for these management issues contains the need to retain use of existing and the establishment of future military flight training areas and routes which may traverse these areas.

Currently several Air Force air operations including instrumentation flight training routes, traverse a portion of the study in question. Although flight training areas, routes, and airspace requirements of the military are subject to change and do change frequently, it is not anticipated that new routes will be established in the immediate future. However, if we do propose any change we will keep you informed.

Mission requirements, fuel costs and environmental constraints determine the decision to locate military training activities. Because of general aviation and population pressures, low level high speed flights are relegated to areas which are least acessible and sparsely inhabited. Therefore, we request that you give full consideration to how planning and management decisions made by your agency may adversely affect or restrict use of low altitude airspace by the military. The Air Force position on this matter is based on the high training and readiness values rendered by use of this low altitude airspace.

We are hopeful this information is useful in your planning. If additional information is needed, our staff point of contact is Mr. Raymond Bruntmyer, (214) 767-2514, or FTS 729-2514.

Sincerely,

DON-MICHAEL BRADFORD, Captain, USAF
Director, Environmental Planning Division

Cy to: HQ USAF/LEEV

United States Department of Agriculture
Forest Service
Beaverhead National Forest
P.O. Box 1258
Dillon, MT 59725
406/683-3900

Reply to: 1920

Date: *

Department of the Air Force
Don-Michael Bradford, Captain
1114 Commerce Street
Dallas, TX 75242

Dear Mr. Bradford:

I appreciate your review of our Revised Draft Environmental Impact Statement and Proposed Forest Plan Supplement. I also appreciate the support you have expressed for our planning process and your continued coordination efforts.

Other than wilderness designation, there is no management emphasis which would adversely affect or restrict use of low altitude airspace by the military. We have assigned recreation management emphasis on seven areas, described as Management Area 8 in the Forest Plan. At least portions of these areas will be used for semi-primitive, nonmotorized recreation activities, such as backpacking, camp [illegible] day hiking, and so on. We would appreciate your consideration of our goals for these areas in planning your military training activities.

Sincerely,

Ronald C. Prichard
RONALD C. PRICHARD
Forest Supervisor

34

E.

United States Department of Agriculture

Office of the Secretary

Office of Equal Opportunity

34-15-06

Washington, D.C. 20250

15 MAR 1985

R 22 A10 58
VERHEAD N.F.
ILLON, MT

SUBJECT: Draft Environmental Impact Statement for Beaverhead National Forest Dillon, Montana

TO: Joseph J. Wagenfehr
Forest Supervisor
Dillon, Montana

THRU: R. Max Peterson
Chief
Forest Service

SUPERVISOR
PLANNING SO
TEAM PLANNER
RANGE/WLDLF SO
HYDROLOGIST
WILDLIFE
GEOMINING
SOILS
[illegible] SO
SILVICULTURE
TIMBER SALE [illegible]
[illegible]
RIGHT OF WAY
ENGINEERING SO
GENERAL
PRECONSTRUCTION
CONSTRUCTION
TRANS PLANNER
ADMIN SO
PERSONNEL
B & F
PURCHASING
SUPPORT SVCS
INFO MGT
RESOURCES
COPY TO:

The draft Environmental Impact Statement (EIS) for the Beaverhead National Forest has been reviewed by this office. The review assessed the civil rights impact of the proposed plan on minorities, women, the aged and handicapped individuals residing in or near the impact area.

Although the Plan as submitted provides an indepth analysis of the possible effects of actions on a variety of elements, a definitive statement regarding civil rights is recommended. We, therefore, offer the following suggestions for inclusion in the Final Statement.

1. In addition to the population changes and growth statistics on III-4, include the following chart under "Social and Economic Setting - a. Population."

	Beaverhead	Madison	Silver Bow	Deer Lodge
White	8050	5394	37,106	12,170
Black	4	0	42	40
Am. Ind.	97	30	538	245
Hispanic	16	17	270	37
Other	19	7	136	26

A

2. The Plan should include a specific statement regarding the impact upon minorities, women, the aged, and handicap individuals. There should be some indication that the listed groups were given an opportunity to be involved in meetings and other activities regarding the proposed plan.

B

C

United States Department of Agriculture
Forest Service
Beaverhead National Forest
P.O. Box 1258
Dillon, MT 59725
406/683-3900

Reply to: 1920

Date: *

USDA, Office of the Secretary
Office of Equal Opportunity
Lawrence Bembry, Acting Director
Washington, DC 20250

Dear Mr. Bembry:

I appreciate your review of our Revised Draft Environmental Impact Statement (EIS). We have considered your comments and have incorporated your suggestions into our Final documents as described in the paragraphs below.

A. We have included a table in Chapter III of the Final EIS similar to the one shown in your response.

B. Relative to National Forest management, it is difficult to segregate effects on these categories of people from effects on others. Minorities and women are incorporated into the discussion of social effects in Chapter II of the EIS. Effects on the elderly are incorporated in the social effects section under "retirees."

C. As noted in the EIS, we solicited participation of the general public in many phases of the planning process, including in commenting on the Draft and Revised Draft Environmental Impact Statements, Proposed Forest Plan and Proposed Plan Supplement. The various groups you mentioned are an integral part of the publics from whom we solicited this participation. Appendix A of the EIS documents our public participation activities.

D. We recognize that there are disparities in the proportionate participation by women and minorities in various sectors of the work force. However, it is difficult for us to differentiate employment and income by categories that separate women and minorities from other workers. Our perception is that changes in employment and income generated from changes in National Forest management will affect women and minorities in approximately the same way other people in the workforce are affected.

Sincerely,

Ronald C Prichard
RONALD C. PRICHARD
Forest Supervisor

3. The Plan should indicate the extent to which minorities and women will benefit from employment during construction of the project. D

Thank you for the opportunity to comment on your draft statement, and we look forward to receiving the final plan.

Lawrence Hembry
Acting Director

United States
Department of
Agriculture

Soil
Conservation
Service

Federal Building-Room 443
10 East Babcock
Bozeman, MT 59715

RECEIVED
85 APR 8 A7:49
BEAVERHEAD N.F.
DILLON, MT

77

April 3, 1985

77-13-06

Joseph J. Wagenfehr
Forest Supervisor
Beaverhead National Forest
P. O. Box 1258
Dillon, MT 59725

Dear Mr. Wagenfehr:

We have reviewed your Revised Draft Environmental Impact Statement, Proposed Land Management Plan and Proposed Forest Plan Supplement.

It appears you have given adequate consideration to most environmental aspects.

Presently, there are about 30 snow course and SNOTEL sites on National Forest land for which we have land use authorization. About 9 of these are SNOTEL sites with radio telemetry, instrument shelters and various climatic and snow sensors. Some of these are in roadless areas.

Our main concern is to keep from having these sites destroyed by logging or roadbuilding or have access restricted through road or area closures.

We are happy to see item No. 10 under Water, on page 11 of the Proposed Forest Plan Supplement, indicating established snow courses will be protected.

We appreciate the opportunity to review these plans.

Sincerely,

Glen H. Loomis
State Conservationist

~~Enclosures~~

The Soil Conservation Service is an agency of the Department of Agriculture

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United States
Department of
Agriculture

Forest
Service

Beaverhead
National Forest

P.O. Box 1258
Dillon, MT 59725
406/683-3900

Reply to: 1920

Date:

Clen H. Loomis
State Conservationist
Federal Building-Room 443
10 East Babcock
Bozeman, MT 59715

Dear Mr. Loomis:

I appreciate your review of our Revised Draft Environmental Impact Statement, Proposed Forest Plan and Proposed Plan Supplement. We have retained the standard to which you refer in your comments. This standard is now Forest-wide Standard WATERSHED #7 in the Forest Plan.

Sincerely,

Ronald C. Prichard
RONALD C. PRICHARD
Forest Supervisor

RECEIVED
85 APR 10 10:53
BEAVERHEAD N.F.
DILLON, MT
82

The Big Sky Country

MONTANA HOUSE OF REPRESENTATIVES
REPRESENTATIVE NANCY A. KEENAN

HELENA ADDRESS
CAPITOL STATION
HELENA, MONTANA 59620
HOME ADDRESS
1421 WEST THIRD
ANACONDA, MONTANA 59711
PHONE: (406) 563-2277

COMMITTEES:
HUMAN SERVICES & AGING, CHAIR
TAXATION
ASSISTANT DEMOCRATIC WHIP

82-06-08

April 9, 1985

Joe Wagenfehr
Forest Supervisor
Beaverhead National Forest
Box 1258
Dillon, Montana 59725

Dear Mr. Wagenfehr:

I am writing to express a few comments on the Beaverhead National Forest Land Management Plan.

Specifically, I would like to see the area directly west of La Marche Creek a recreation only designation. I have had opportunity to utilize that area for recreational purposes and found it to be well groomed and beautifully maintained.

I sincerely feel that the people of southwest Montana cherish the availability and access to that area. I would strongly encourage you to designate that area for recreational purposes.

If you need additional information please do not hesitate to contact me.

Sincerely,

Nancy Keenan

Nancy A. Keenan
Representative

NAK/je

United States Department of Agriculture
Forest Service
Beaverhead National Forest
P.O. Box 1258
Dillon, MT 59725
406/683-3900

Reply to: 1920

Date:

Representative Nancy A. Keenan
Montana House of Representatives
Capitol Station
Helena, MT 59620

Dear Ms. Keenan:

The LaMarche Creek area has received intensive review and comment since the 1982 Draft Land Management Plan. The area west of LaMarche Creek from the Forest boundary north to the Anaconda-Pintler Wilderness, and west to the top of the ridge above LaMarche Creek has been changed to Management Area 1 (custodial management). This change was made for two reasons: to observe the level of demand that develops for recreational use in the vicinity of Sundance Lodge, and to defer inclusion of some potentially productive timber land on steep slopes west of LaMarche Creek until we are confident that we can harvest the area with appropriate technology and still meet the visual quality objective as viewed from the Sundance Ranch. The area east of LaMarche Creek remains in the timber base, but the Managment Area has been changed to MA 18 to better recognize the recreation use along LaMarche Creek road. We recognize that we may have some impacts on recreational use of the area; however, these impacts will be relatively site-specific and short term.

Thank you for taking time to review our Proposed Forest Plan.

Sincerely,

Ronald C. Prichard
RONALD C. PRICHARD
Forest Supervisor

United States Department of the Interior
BUREAU OF MINES
WESTERN FIELD OPERATIONS CENTER
EAST 360 3RD AVENUE
SPOKANE, WASHINGTON 99202

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85 APR 17 P2:43
BEAVERHEAD N.F.
DILLON, MT

MINERALS & GEOLOGY
APR 0

98

98-15-06

April 2, 1985

Leasable
Land Law Examiner
Applications Examiner
Computer System Analyst
Computer Assistant
Locatable
Mining Assistant
✓ Resource Geologist
✓ [illegible]
Economist
✓ Soil Scientist
Program Assistant
Secretary
Clerk/Typist
File

Mr. Buster LaMoure
Director of Minerals and Geology for Region 1
U.S. Forest Service/Northern Region
Federal Building
Missoula, Montana 59807

Dear Mr. LaMoure:

SUBJECT: MINERALS AND GEOLOGY SECTION OF THE
BEAVERHEAD NATIONAL FOREST ENVIRONMENTAL IMPACT STATEMENT

Our review of the Minerals and Geology Section of the Beaverhead National Forest Environmental Impact Statement (EIS) showed it to be the most informative, comprehensive general statement for minerals of all the BLM or Forest Service management plans and environmental statements we have reviewed. It was the first we have seen that realistically examined the impacts these plans will have on minerals.

We have copied this section and sent it to other forests as an example of how minerals should be covered in these documents.

Please encourage the Forest Service to use the Minerals and Geology Section of the Beaverhead National Forest EIS as a guide for all future forest management plans and EIS's.

Thank you.

Sincerely,

D'Arcy P. Banister
D'Arcy P. Banister, Supervisor
Minerals Involvement Section

✓	SUPERVISOR		ENGINEERING SO
✓	PLANNING SO		GENERAL
	TIMBR PLANNING		PRECONSTR
✓	RANGE/WLDF SO		CONSTRUCTION
	HYDROLOGY		TRANS PLANNER
	WILDLIFE		ADMIN SO
✓	GEO/MINING		PERSONNEL
	SOILS		B & F
	TIMBR/FBC SO		PURCHASING
	SILVICULTURE		SUPPORT SVCS
	TIMBR SALES PREP		INFO MGT SEC
	LNDSCP/ARCH SEC	✓	RESOURCES
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	OTHERS:		

Pg. 1 of 3

United States Department of Agriculture
Forest Service
Beaverhead National Forest
P.O. Box 1258
Dillon, MT 59725
406/683-3900

Reply to: 1920

Date: *

D'Arcy P. Banister, Supervisor
Minerals Involvement Section
Bureau Of Mines
Western Field Operations Center
East 360 3rd Avenue
Spokane, WA 99202

Dear Mr. Banister:

We appreciate your review of our Revised Draft Environmental Impact Statement and your comments.

Sincerely,

Ronald Prichard
RONALD C. PRICHARD
Forest Supervisor

United States Department of the Interior
GEOLOGICAL SURVEY
BOX 25046 M.S. 930
DENVER FEDERAL CENTER
DENVER, COLORADO 80225

RECEIVED
85 APR 23 P 1: 44
BEAVERHEAD N.F.
DILLON, MT

IN REPLY REFER TO:

100

February 5, 1985

100-15-06

Ms. Kathy Wilkerson
Beaverhead National Forest
P. O. Box 1258
Dillon, Montana 59725

Dear Kathy:

I was asked to look over the revised DEIS for the Beaverhead Forest. The portions on minerals appear to me to be complete and balanced. I did notice, however, a couple minor inconsistencies that you may want to check.

In volume 2, the roadless area descriptions, the ratings given in the tables do not correspond to those given in the narrative portion for at least two areas. The table on page C-138 says that two-thirds of the area has low potential, but p. C-139 says all of the area is moderate to high. Pages C-173 and C-175 contain a similar discrepancy. I did not check the table vs. the text systematically for each area. Perhaps you should do that.

Thank you for the announcement that arrived yesterday. Congratulations to you and Randy. Isn't it nice to know that you can function on only a few hours sleep each night.

Sincerely yours,

Bob

Robert C. Pearson
Central Mineral Resources

United States Department of Agriculture
Forest Service
Beaverhead National Forest
P.O. Box 1258
Dillon, MT 59725
406/683-3900

Reply to: 1920

Date: *

Robert C. Pearson
Geological Survey
Box 25046 M.S. 930
Denver Federal Center
Denver, CO 80225

Dear Mr. Pearson:

We appreciate your attention to detail and your comment. Volume II of the Environmental Impact Statement has been corrected.

Sincerely,

Ronald C Prichard
RONALD C. PRICHARD
Forest Supervisor

United States Department of the Interior
OFFICE OF THE SECRETARY
OFFICE OF ENVIRONMENTAL PROJECT REVIEW
Room 488, Building 67
Denver Federal Center
Denver, Colorado 80225

RECEIVED
85 APR 25 A10:42
BEAVERHEAD N.F.
DILLON, MT

April 22, 1985

IN REPLY REFER TO:
ER 85/66

108

108-15-06

Mr. Joseph J. Wagenfehr
Forest Supervisor
Beaverhead National Forest
P.O. Box 1258
Dillon, Montana 59725

Dear Mr. Wagenfehr:

This is in response to your request for the Department of the Interior's review of the proposed forest plan supplement and revised draft Environmental Impact Statement (EIS) for the Beaverhead National Forest. Our comments, which are in addition to those submitted on July 29, 1982, are organized topically.

GENERAL

We find these documents readable and well organized. We appreciate those responses to our earlier comments which have been incorporated into these supplemental documents, however, many of our original comments remain valid.

PROPOSED FOREST PLAN SUPPLEMENT

Threatened and Endangered Species

U.S. Fish and Wildlife Service's (FWS) concerns about threatened and endangerd species are not discussed herein. The Forest Service has initiated Section 7 consultation with the FWS Endangered Species Field Office in Helena, and coordination is underway. Comments on threatened and endangered species will be handled through the consultation process. Consultation results should be reflected in the final Plan and EIS. A

Fish and Wildlife Resources

We commend the Forest Service for the special attention given to riparian habitat and for including raparian-grazing prescriptions in the revised plan in an effort to manage riparian vegetation, streambank stability, water quality, fish habitat, as well as habitat for many game and nongame species. Providing sufficient funding to monitor this effort will be critical if it is to succeed. We think that an additional monitoring effort should be funded in which the main focus of the effort would be to ascertain whether objectives for riparian habitat are being achieved. Presently, monitoring and evaluation activities that address riparian habitat are included under the range, water and soil, and timber resource elements of the monitoring program (D-5, F-4, and E-3 of Table V-1 on pages A.1.

United States Department of Agriculture
Forest Service
Beaverhead National Forest
P.O. Box 1258
Dillon, MT 59725
406/683-3900

Reply to: *

Date: *

Robert F. Stewart
Regional Environmental Officer
United States Department of the Interior
Office of Environmental Project Review
Room 488, Building 67
Denver, Colorado 80223

Dear Mr. Stewart,

In the past few months we have been finalizing our Forest Plan. In doing so, we have considered the suggestions and comments on our Proposed Forest Plan and Revised Draft EIS submitted by approximately 850 individuals, groups, organizations, and agencies. In many instances, we have made changes in our Forest Plan in response to the concerns raised in these comments.

We want to thank you for becoming involved in our planning process and for offering your suggestions and comments. We believe that our Forest Plan is much improved and responds well to the concerns raised by our publics. We have enclosed a copy of your comment letter, and our response to your comments is as follows:

A. The Forest Plan Goals (1.c.), Objectives (Wildlife, last paragraph), and Forest-wide Standards under Threatened and Endangered Species respond to this concern.

A.1. We have incorporated a monitoring element into the Forest Monitoring Action Plan (Forest Plan) that specifically focuses on the riparian area and our management objectives for it. As you suggest, our focus is on ascertaining whether or not objectives for riparian habitat are being achieved. Monitoring will focus on the effectiveness of standards that control range and timber uses of the area.

162-172 of the Proposed Plan). We think this approach is logical, but it may frustrate attempts to assess the cumulative effects of management strategies designed to protect the integrity of riparian habitat. We would like to see management activities related to grazing, timber harvesting, recreation, wildlife, roads, and so on, integrated into a statement of intent that would help to focus the Forest Service's attempt to monitor the effectiveness of strategies to manage riparian habitat. A1.

We are pleased to read that livestock will be systematically managed and that the timing of livestock entry to allotments will be considered to reduce conflicts. We are in favor of cattle removal as a management option when residual forage levels are attained or when habitat degradation occurs. We are also pleased that fences will be constructed to better define pasture boundaries, to protect sensitive areas, and to exclude cattle from some key-wildlife areas. We are strongly supportive of the restriction of livestock development on secondary range as well as reduced forage utilization by cattle in riparian areas and on winter ranges. Again, a strong, well-funded monitoring program will be a key to success.

We commend the Forest Service's intention to apply the recommendations of the "elk logging study" whenever possible. When it is not possible, we recommend that close consultation occur with a local State game biologist. Also, we encourage you to incorporate all of the recommendations of the final study (recently available) into the final Plan. B

We urge that the amount of timber scheduled to be cut in the West Big Hole area be reconsidered. The combination of fish and wildlife resources in this area has outstanding recreation appeal and is rare on a State, regional, and national basis. Several blue ribbon trout streams (Madison, Big Hole, and Beaverhead Rivers) of national significance will be affected. It appears that maintaining the integrity of these resources should be given additional attention. Also, the reduction of security cover in this area is expected to have significant adverse effects on the quality of elk hunting in the area. C

We were pleased to note the inclusion of the section describing snag management standards. However, we did not notice any reference in the standards to the statutory responsibility that the Forest Service has under Section 404 of the Clean Water Act. We feel strongly that a standard should be added that acknowledges the requirement to obtain necessary permits prior to undertaking projects that may necessitate the placement of fill below ordinary high water or in wetlands. D We would also like to see acid rain referenced as having a potential to influence water quality and fisheries. Perhaps an appropriate place to incorporate this would be in the water quality monitoring exercises already included. E

We suggest the following priorities for hard snag retention: 1) cull snags, 2) unmerchantable snags, and 3) merchantable snags. F

Minerals

We propose adding a 10th item (p. 13) as follows: "Oil and gas drilling on the National Forest lands is encouraged when needed to protect those lands from hydrocarbon drainage by development on adjacent nonfederal lands." G

The meaning of Item No. 6 is not clear to us. Could it be restated? H

B. Forest-Wide standards Wildlife #1 and #6 address this concern.

C. We have reduced the acres on which timber harvest can be scheduled in the Big Hole drainage in the Final Forest Plan. This has resulted in a corresponding reduction in the amount of timber scheduled to be cut.

D. Compliance with the Clean Water Act is addressed in Forest-wide standard Watershed #3. We have not added a standard addressing section 404 as that is clearly stated in the regulations and Forest Service Manual which the Forest Plan standards are intended to "supplement, not replace" (paragraph 1, Section E, Chapter II of the Forest Plan).

E. We concur that acid rain has the potential to affect water quality and fisheries. However, we have not addressed acid rain in this Forest planning process, because it is not an environmental consequence of our management. The Forest Service is involved in monitoring the impacts associated with acid rain; however, we believe that is not an appropriate aspect of our Forest monitoring plan, the purpose of which is to gather the data necessary to determine if the Forest Plan is being implemented.

F. We will determine, at the project level, which snags are to be left in accordance with Forest-wide SNAG MANAGEMENT Standards. We do concur, however, with the priorities as you have them listed.

G. We have not adopted the proposed standard because we believe Forest-wide Standard Minerals #7 addresses your concern to the extent we, as surface resource managers, find appropriate.

H. We have clarified the language in Minerals #6.

108-15-06

Lands

Items No. 8 and No. 9 are identical. Is there an item missing? I

National Trails

In 1982, we asked that the forest plan particularly recognize and specify means for coordination with the approved Comprehensive Plan for the management and use of the Lewis and Clark National Historic Trail. We still do not see evidence of this recognition in the Proposed Forest Plan Supplement. J

Timber

It has been the experience of BLM in this area that adequate restocking of Douglas fir sites by natural regeneration would often take 10 to 15 years. We suggest that the costs of artificial regeneration implied by a 5 year target for adequate stocking levels may be excessive. K

REVISED-DRAFT EIS

Fish and Wildlife Resources

The last paragraph, (p. III-15) mentions that the trumpeter swan is known to nest in the southeastern section of the Gravelly Range. We would like to have this historical nesting territory discussed more completely in the document. The nesting territory has existed historically on Elk Lake in the southeast portion of the Madison District, just outside the boundary of Red Rocks National Wildlife Refuge. The nesting territory has reportedly been the most stable territory in the tri-state area for over 40 years. This area has played an important role in the overall recovery of the trumpeter swan from near extinction. We would like to have this nesting territory considered in the management of this area in such a way that the integrity of the territory will be preserved. L

We would also like to see a better discussion concerning the nongame wildlife found on the forest. The discussion in its current form (pp III-13 to 16) is weak. Also, the discussions are weak to nonexistent throughout the draft EIS on how management strategies would affect nongame wildlife, including migratory birds. We would like to see these addressed in the final EIS. M

Habitat improvement projects are discussed (pp. IV-14 to 17) that would involve rejuvenating decadent aspen stands and willow bottoms and blasting potholes for waterfowl. We support these projects and the use of fences to reduce the destructive influence that cattle can have on sensitive areas. When potholes are blasted for waterfowl, will the area be fenced to keep cattle away from the pothole? We are concerned that without fencing, such areas will have limited value to waterfowl. N

I. This editorial error has been corrected.

J. As documented in Appendix A of the Final EIS, we have reviewed the National Park Service "Lewis and Clark National Historical Trail - Comprehensive Plan for Management and Use" and have not identified conflicts with this Plan. Management Area #29 (Forest Plan) ensures that "direction contained in the Lewis and Clark National Historic Trail Comprehensive Plan will be followed."

K. The National Forest Management Act (NFMA) regulations require that "the technology and knowledge exists to adequately restock the lands (harvested) within five years after final harvest." On the Beaverhead, that requirement can be met, usually without artificial regeneration. Artificial regeneration is programmed where natural regeneration attempts fail.

L. The trumpeter swan has been nominated by the Forest to be included on a list of "sensitive species" being developed for the Northern Region. In addition, the trumpeter swan has been designated an "indicator species." Finally, in areas considered inhabited or potential trumpeter swan nesting territory, the management area direction has been evaluated to insure the integrity of the nesting habitat is preserved. Forest Plan Monitoring Requirements indicate efforts to insure habitat protection will be reviewed periodically.

M. We have strengthened our discussion of nongame wildlife in Chapter III of the Final EIS. In addition, we have improved our presentation in Chapter IV (EIS) relative to impacts on nongame wildlife associated with National Forest management activities.

N. Generally pothole blasting has occurred and is expected to occur in marshy areas where the wetness of the site and unpalatable vegetation make the area undesirable to livestock. If potholes are blasted for waterfowl in drier upland areas, fencing would be used as necessary to keep cattle away from the pothole.

108-15-06

Mr. Joseph J. Wagenfehr 4

Minerals

Table II-11 and the discussion on pages IV-20 to 30 are noteworthy in their recognition that management practices may impose varying degrees of restrictions on access for the development of mineral resources. We would suggest, however, that the narrative descriptions of minerals management (pp. II-14 to 37) be expanded to state more specifically the extent of such restrictions under each of the alternatives. O

The discussion on pages IV-29 to 31 would benefit from more technical input and attention to the range of possible oil and gas development scenarios (i.e., deep dry natural gas on 640-acre spacing to shallow oil with salt water on 40 or 80-acre spacing). Dry gas is most probable for this area. P

We suggest that the first paragraph of "Exploratory Drilling" (p. IV-28) be revised to more fully portray the division of authority and responsibility between BLM and the Forest Service Q

The emphasis on salt problems (p. IV-29, 4th para.) is misplaced, since there is little likelihood of salt production with Overthrust area oil and gas. With regard to H_2S, it should be mentioned that BLM requires-H_2S contingency plans prior to approval of applications to drill (APDs) in areas having H_2S potential.

On the following pages, the possible spillage of toxic materials is mentioned. The EIS should recognize that such spills, as well as "blowouts," have a low probability of occurrence. R

National Trails

We repeat our 1982 comments requesting analysis of impacts on the Continental Divide National Scenic Trail and the Lewis and Clark National Historic Trail. S

The statement (p. A-5) that the forest plan will preserve that portion of "the trail" on national forest land, is somewhat confusing. We presume that this is a reference to the Nez Perce Trail, and suggest that it be clearly stated. T

Sincerely,

Robert F. Stewart
Robert F. Stewart
Regional Environmental Officer

O. We believe the extent of restrictions on mineral activities can most graphically be portrayed through Table II-11; therefore we have limited the verbal description in Section C of Chapter II of the EIS. The effects of alternatives on mineral availability and accessibility are discussed further in Section 18, Chapter II of the EIS.

P. We have re-evaluated our discussion of minerals in Chapter IV of the EIS and believe the information is adequately presented. We have avoided technical discussions to the degree possible.

Q. We have made no changes in the EIS in response to this paragraph. We do not believe the added detail would be relative to the discussion of impacts in Chapter IV.

R. We have modified this paragraph in the Final EIS to state that the probability of such incidents is low and that the BLM requires contingency plans prior to giving drilling approval.

S. . Management direction for the Lewis and Clark Trail is to follow the umbrella direction contained in the Comprehensive Plan, maintain the motor routes suitable for use by passenger and recreational vehicles, develop interpretive facilities at historic sites (including Sacagawea Spring and Lemhi Pass), and develop trail head facilities at Lemhi Pass in conjunction with the Continental Divide National Scenic Trail when use levels indicate the need. The Forest-wide and Management Area-specific Standards ensure the integrity of the Trial corridor. As indicated in the Management Area (MA) goals, some low intensity timber management may be applied within the corridor to "ensure healthy stands of timber. The MA Standards do provide that management activities will meet visual sensitivity levels once these levels are assigned. Road construction and/or reconstruction may be allowed where necessary to meet the MA goals. However, roads will be designed to "minimize disruption of the recreation experience of the road user." (Forest Plan, Management Area #29)

T. We have clarified our intent in Appendix A regarding the Big Hole National Battlefield Statement of Management and the "Ne-Mee-Poo Trail."

Sincerely,

Ronald Prichard
RONALD C. PRICHARD
Forest Supervisor

PAT WILLIAMS
MONTANA, WESTERN DISTRICT

MAJORITY DEPUTY WHIP

COMMITTEES:
BUDGET
CHAIRMAN
TASK FORCE
ON HUMAN RESOURCES
EDUCATION AND LABOR
CHAIRMAN
SELECT EDUCATION
SUBCOMMITTEES:
ELEMENTARY, SECONDARY AND
VOCATIONAL EDUCATION
EMPLOYMENT OPPORTUNITIES
LABOR STANDARDS
POSTSECONDARY EDUCATION

Congress of the United States
House of Representatives
Washington, DC 20515

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59601
MISSOULA
(406) 549-5550
302 W. BROADWAY
59802

RE[illegible] 85 [illegible] 13 [illegible] 11 22
BEA[illegible] DILLON MT

May 8, 1985

151

151-15-11

Mr. Joseph Wagenfehr
Forest Supervisor
Beaverhead National Forest
P.O. Box 1258
Dillon, Montana 59725

Dear Joe:

I am writing to clarify my understanding of the Forest Service position regarding Madison County's desire to place a communications relay on top of Mount Jefferson in the Tobacco Roots. David Blair of my staff recently discussed the situation with District Ranger Vergil Lindsey.

First, it is my understanding that the Forest Service will reopen the question of placement of a facility on Mount Jefferson upon settlement of the wilderness question in the Tobacco Roots. And second, that location of a facility at that location will not be precluded under the management scheme for the location outlined in the Proposed Beaverhead Forest Plan.

I would suggest that there be some mention of this proposal in the final draft of the plan. I also appreciate your careful consideration, at the appropriate time, of Madison County's proposal.

Thank you for your attention to these concerns. Please direct all correspondence to me in this matter to my office at 302 West Broadway, Missoula, Montana 59802.

Sincerely,

Pat

Pat Williams

✓	SUPERVISOR		ENGINEERING SO
✓	PLANNING SO		GENERAL
	TIMB PLANNING		PRECONSTR
	RANGE/WLDF SO		CONSTRUCTION
	HYDROLOGY		TRANS PLANNING
	WILDLIFE		ADMIN SO
	GEO/MINING		PERSONNEL
	SOILS		[illegible]
	TIMB/REC SO		[illegible]
	SILVICULTURE		SUPPORT [illegible]
	TIMB/SALES FIRE		[illegible]
	LNDSCP/ARCH REC		RESOURCES
	RIGHT-OF-WAY		COPY TO:
	OTHERS:		

United States Department of Agriculture
Forest Service
Beaverhead National Forest
P.O. Box 1258
Dillon, MT 59725
406/683-3900

Reply to: 1920

Date: *

Honorable Pat Williams
2457 Rayburn Building
Washington, DC 20515

Dear Congressman Williams:

The location requested by Madison County for the repeater site is in Forest Plan Management Area 8. Goals, objectives, and standards for this Management Area do not preclude construction of the facility at the requested location.

We have incorporated your suggestion to mention Madison County's interest in the site in the Geographical Display Area description for the Tobacco Roots (Forest Plan, Geographical Display Area 4C). If Madison County wishes to pursue the matter, we will reconsider the County's proposal once the Forest Plan is approved and implementation of the Plan can begin.

Sincerely,

Ronald C Prichard
RONALD C. PRICHARD
Forest Supervisor

Board of County Commissioners
Box 278
Virginia City, Montana 59755

Phone 843-5444

171

May 16, 1985

171-11-07

Forest Supervisor
Beaverhead National Forest
PO Box 1258
Dillon, MT 59725

To Whom this may concern,

As a Madison County Commissioner, I am concerned with the various winderness designations for property in this County. RAREII Wilderness recommendations stated that the Middle Mountains Tobacco Root area be included in wilderness. Frankly, this area has been traditionally used for not only recreation, but also mining, surveying, and to some extent, agriculture. The Beaverhead National Forest proposed forest plan recommends that this area be withdrawn from the RARE II recommendations. I wholeheartedly support this recommendation for non-wilderness area in the Tobacco Roots.

Sincerely,

Marie McAlear
Marie McAlear
Commissioner

MM:dk

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85 MAY 17 A10:48
BEAVERHEAD N.F.
DILLON, MT

United States Department of Agriculture | Forest Service | Beaverhead National Forest | P.O. Box 1258
Dillon, MT 59725
406/683-3900

Reply to: 1920

Date: *

Board of County Commissioners
Marie McAlear, Commissioner
Box 278
Virginia City, MT 59755

Dear Mrs. McAlear:

Management Area assignments recognize the recreation, mining, and agricultural values in the Tobacco Roots area. These assignments are shown on the Forest Plan Map and discussed in Chapter III of the Forest Plan.

The Tobacco Roots Planning Unit currently has two inventoried roadless areas: 1-014, Potosi, and 1-013, Middle Mountain Tobacco Roots. These areas, and potential impacts to the roadless character of the areas under each alternative, is discussed in detail in Appendix C of the Final Environmental Impact Statement. We are not recommending any portion of the Tobacco Roots for wilderness designation in the Forest Plan.

We appreciate your continuing interest in our Forest Plan.

Sincerely,

Ronald C Prichard
RONALD C. PRICHARD
Forest Supervisor

BEAVERHEAD COUNTY PLANNING BOARD
P.O. BOX 351
DILLON, MONTANA 59725
406/683-4862

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85 MAY 31 AM 11:16
BEAVERHEAD N.F.
DILLON, MT.

339

May 28, 1985

Joe Wagenfehr, Supervisor
Beaverhead National Forest
P.O. Box 1258
Dillon, Montana 59725

339-02-07

Dear Mr. Wagenfehr:

The Beaverhead County Planning Board has reviewed the Revised Draft Environmental Impact Statement and the proposed Beaverhead Forest Plan and wishes to submit the following comments:

First, we would like to address our remarks to the major issues listed in your "Overview".

Major Issue 1 - Use of forage by domestic livestock

We agree with your proposals to increase livestock forage production on the Forest. Livestock grazing is vital to the economy of Beaverhead County. Maintaining and improving forage production on the Beaverhead Forest is an important goal in order to maintain a healthy livestock industry. We commend you for proposing noxious weed control and for planning to have AMP's for all livestock grazing areas of the Forest. Proper range management is a most worthwhile goal. A
We question how you will implement your plan to set standards and manage the protection of streambank vegetation. How will this affect livestock grazing? Will proper and well distributed watering spots be left for domestic livestock? B

Major Issue 2 - Timber harvests

We object to a cut from the current level of timber production and the prospect of staying at that level if the West Pioneers are not released for non-wilderness use. Again, timber production is vital to the economy of Beaverhead county. C
Concentrating the timber harvest in diseased timber areas should help to control the spread of disease. Disease controls should also include spraying for insects to protect the timber source. D
What will happen to the roads built for the timber harvest? Will they be closed or left open for more access to the Forest? E

United States Department of Agriculture
Forest Service
Beaverhead National Forest
P.O. Box 1258
Dillon, MT 59725
406/683-3900

Reply to: 1920

Date: *

Beaverhead County Planning Board
Bob Mountain, Vice-Chairman
P.O. Box 351
Dillon, MT 59725

Dear Mr. Mountain:

I appreciate the County Planning Board's review of the our Revised Draft Environmental Impact Statement and Proposed Forest Plan. In the following paragraphs, I have addressed the points raised in your letter.

A. We appreciate your support for our goals for management of the grazing program on National Forest lands.

B. Riparian areas are managed for the benefit of riparian dependent resources, including livestock grazing. Management goals provide for maintaining livestock grazing opportunities within standards designed to protect all riparian dependent resource values.

Specific guidance for stream bank protection and implementation of Forest standards regarding protection of bank vegetation and water quality will be included in individual allotment management plans. Concentration of livestock in riparian areas will be minimized through development of livestock grazing management systems and structural improvements. Stream watering spots will be maintained where there is no unacceptable damage to the riparian area. Alternative water sources outside the riparian area will be developed where environmentally and economically feasible. The Forest Plan also indicates that salting for livestock distribution will occur outside of riparian areas.

C. Timber harvest levels in the Forest Plan have been reduced from 20.6 MMBF per year to 17.3 MMBF per year in the Final.

We recognize that timber harvest is important to the economy of Beaverhead County. However, in considering the interrelationship between the resource values and the differing demands placed on those resources by the Forest publics we have decreased the acreage available for timber harvest. This has resulted in a corresponding decrease in the yearly programmed harvest.

D. Complete control of insects and disease in the Forest is neither possible nor necessarily desirable. However, the adverse effects of insect and disease infestation can be lessened by using silvicultural treatments that will either regenerate stands or reduce their susceptibility. If these silvicultural treatments are promptly and properly applied, they can mitigate many of the adverse effects of the insect epidemics. In addition, they can benefit many of the Forest's resources such as wildlife, which are not at their full potential because of the age uniformity of the Forest's tree stands.

Spraying for insects is economically unfeasible and has not been proven to be very effective. In addition, the environmental effects would have to be assessed. In other areas where spraying has been proposed, the idea has met with strong public opposition.

E. Approximately 338 miles of road will be constructed over the next ten years, largely in support of the timber management program. About 53 miles will be arterial and collector roads, usually requiring capital investment funds for construction. Construction of this arterial and collector mileage will complete the majority of the main accesses needed for management of the suitable timber land base identified in this Forest Plan. The rest of the roads to be constructed are local roads.

339-02-07

Major Issue 3 - Recreation opportunities made available to the public

Recreation is good for the economy of Beaverhead County. Timber roads opening up access to more areas will offer more recreation opportunities to the public. However, there are plenty of recreational sites now in the Forest. More roads and recreational accesses will affect livestock grazing adversely. More fencing, gates and cattle guards will be necessary.

F

Major Issue 4 - Provide wildlife habitat - elk and fish objectives

Elk number should be limited to a reasonable amount. Private landowners must provide much of the feed for elk now. Increasing elk numbers would increase the problems. First consideration on the Forest should be for domestic livestock. The elk compete with domestic livestock for forage on both public and private lands. In proposing limiting use of riparian zones to protect fisheries, will the livestock be shut out of the meadows entirely? How do you propose to provide this protection?

G

H

Major Issue 5 - Additional public access

There are numerous proposed access sites to the Forest. Even though the proposal is to get clear title to these roads from private landowners for Forest access, are this many really needed when there is ample access on the road between Polaris and Wise River? Will there be protection for the private landowner whose property is crossed by these access roads? Will the increased number of access roads invite subdivisions which could be in conflict with the Beaverhead County Comprehensive Plan?

I

J

K

Major Issue 6 - Exploration and development of mineral and energy resources

Mineral production is very important to the economy of Beaverhead County and should not be decreased. We wonder if there are some rare minerals in designated wilderness areas which will be closed off forcing us to import them from other countries?

L

Major Issue 7 - Wilderness area recommendations

We are opposed to any more wilderness area designation in

Most of the new roads constructed on the Forest will be closed to motorized public access with the exception of snowmobile use. More will be closed in the fall than during the rest of the year to maintain elk security. Some will be closed year long.

F. Access guidelines define the level and degree of public access to be provided to an area of the National Forest. When we evaluate projects that require roads, we will decide whether the roads will remain open or be closed based on these guidelines.

The Forest Plan states that "where road construction creates opportunities for livestock drift problems, cattleguards and fences will be installed as needed."

G. While the Forest does not have the authority to determine the "reasonable" elk numbers, the Forest has worked closely with the Department of Fish, Wildlife and Parks to provide sufficient habitat for the "reasonable" numbers of elk established by that agency. The Forest Plan maintains elk habitat security and provides for diverse, high quality hunting opportunities and carrying capacity for herd populations that will not create conflicts with private landowners' needs.

Domestic livestock use on winter ranges and on other key areas will be restricted to ensure availability of adequate forage for wintering elk, thus reducing impacts on private lands.

H. See response paragraph B.

We do not anticipate shutting livestock out of meadows if we can achieve our management objectives in other ways.

I. The need for public access to the Forest boundary was identified as a public issue. In addition, Forest managers have identified a need for access to implement management activities.

Although the Wise River-Polaris Road provides access to the eastern portion of the West Pioneers, access to the western slopes is poor. Identified accesses will substantially improve this situation, thus protecting traditional access and ensuring that these accesses through public will remain open to the general public.

J. The Forest Plan indicates that "Informational and educational efforts will focus on clarifying regulations and the rationale underlying them to reduce conflict...to reduce inappropriate visitor and user behavior."

K. It is not the intent of the Forest to "invite subdivisions which could be in conflict with the Beaverhead County Comprehensive Plan." Our objective is to provide needed public access to the Forest.

L. Existing rights to prospect, develop, and mine on National Forest lands open to mineral entry will be recognized in implementation of the Forest Plan.

Trade-offs between mineral and energy resources and wilderness designation for each area have been discussed in Appendix C of the Final EIS.

339-02-07

Beaverhead County. This has been a long time goal in the County Comprehensive Plan. Another goal has been to protect the agricultural, forest products, and mining segments of the economy by supporting the continued multiple use of public lands. We do not believe that locking up our natural resources is in the best interests of the economy of the county or the people who live and work here. M

Overall, we believe your proposed alternative H (and HA) is the least objectionable proposal presented. We believe it supports most of the goals of our Comprehensive Plan, except for wilderness designations and lowered timber production, and is the most reasonable alternative offered without favoring any special interest group.

We would appreciate your consideration of our comments.

Yours Truly,

Bob Mountain, Vice-Chairman
Beaverhead County
Planning Board

BM/pk

M. The Forest Plan recommends for wilderness classification "those areas of National Forest that have received a high level of public support for wilderness classification and where the conflict with other resource uses can be minimized."

If roadless areas recommended in the Forest Plan for wilderness classification are incorporated into wilderness designation, new wildernesses in Beaverhead County will include: the West Big Hole Wilderness (55,000 acres), the East Pioneers Wilderness (80,000 acres) the Italian Peaks Wilderness (25,700 acres, shared with the Targhee National Forest), and the North Big Hole (6,600 acres) and Storm Lake (1,700 acres) additions to the Anaconda-Pintler Wilderness.

Although timber harvest and new mining claims are not allowed, other resource uses continue. For example, existing allotments are maintained and managed in accordance with wilderness values. Existing water storage will be maintained. Valid existing mineral rights established in the areas prior to withdrawal are recognized. Existing primitive and semi-primitive nonmotorized recreation opportunities are maintained. Trail construction may be permitted, or, if compatible with management objectives, existing trail systems may be upgraded.

If you have any questions about my responses to your comments or if you would like to further discuss some of these points, please feel free to call or to stop in at my office.

Sincerely,

Ronald C Prichard
RONALD C. PRICHARD
Forest Supervisor

United States
Environmental Protection
Agency

Region 8 Montana Office
Federal Building
301 S. Park, Drawer 10096
Helena, Montana 59626

EPA

RECEIVED
85 MAY 31 A10:49
BEAVERHEAD N.F.
DILLON, MT

Ref: 8MO
371

May 30, 1985

371-14-06

Mr. Joseph J. Wagenfehr
Forest Supervisor
Beaverhead National Forest
P. O. Box 1258
Dillon, Montana 59725

Dear Mr. Wagenfehr:

Thank you for the opportunity to review your agency's "Revised Draft Environmental Impact Statement - Beaverhead National Forest" and "Proposed Forest Plan Supplement". Specific comments are found in the attachment.

The U. S. Environmental Protection Agency (EPA) appreciates your concern for preservation of water quality of the Beaverhead Forest. Reducing the proposed timber harvest, and associated road building, in your selected alternative over those levels shown in your previous DEIS should protect water quality. We also support your proposals to leave a very large acreage of the forest in a non-road status. This should also help protect the area's very high quality waters. Nevertheless, you need to closely monitor the water quality impacts of timber harvest and road building. We also believe you should be prepared to stop, modify, or cancel all land disturbance activity that is or has the potential to violate State Water Quality Standards.

According to EPA's system for rating draft impact statements, this DEIS is rated EC-2 (environmental concerns - insufficient information). The basis for this rating is as discussed in the attachment.

If you have any questions or concerns, please call me at (406) 449-5432.

Sincerely yours,

John F. Wardell
John F. Wardell, Director
Montana Office

Attachment

United States
Department of
Agriculture

Forest
Service

Beaverhead
National Forest

P.O. Box 1258
Dillon, MT 59725
406/683-3900

Reply to: 1920

Date: *

Environmental Protection Agency
John F. Wardell, Director
Federal Building
301 S. Park, Drawer 10096
Helena, MT 59626

Dear Mr. Wardell:

I appreciate your review of our Draft documents and your comments. In the Final Forest Plan, we are giving high priority to management efforts to maintain existing high water quality.

Water and soil monitoring and evaluation are essential facets of Forest Plan monitoring. The Forest Plan Monitoring Requirements (Forest Plan, Table IV-1) present the strategy to be used in monitoring the effects of Forest Plan implementation on soil and water quality and quantity, and the effectiveness of the predictive models that are used at the project level.

The Forest Plan indicates that "Best Management Practices" (BMP's) will be developed and implemented at the project level in the Forest Objectives (Section C); Forest-wide Standards (Watershed #4, Soils #1, Range #10, and Facilities #2); and Management Area Standards. In addition, specific BMP's are included as Forest-wide or Management Area Standards. The Forest Plan Implementation Chapter, Section C, indicates that:

> As part of project planning, site specific water quality effects will be predicted and evaluated and control measures designed to ensure that the project will meet Forest water quality standards. Projects where analysis indicates that, even with mitigation measures, Forest water quality standards can not be met will be redesigned, rescheduled, or dropped from the program.

Furthermore, the Forest Plan Monitoring Requirements show that a critical monitoring element in both the Watershed and Soils elements addresses the effectiveness of BMP's utilized on project activities.

The Forest Service expresses committment to importance of water quality monitoring through the Forest Plan direction and in the programming and budgeting phases of Forest Plan implementation. We are establishing seven monitoring stations on the Forest to measure daily streamflow and sediment, the major pollutant from Forest activities. These stations will provide data to validate or change the sediment model we are using in our monitoring scheme.

Sincerely,

Ronald C. Prichard
RONALD C. PRICHARD
Forest Supervisor

371-14-06

ATTACHMENT
BEAVERHEAD NATIONAL FOREST

1. The Beaverhead National Forest documents are very generalized. The overall goals, objectives and standards have great individual and collective merit. Actual compliarce with these is, however, very subjective and will require many trade-offs in deciding how and whether a particular proposed "use" will proceed. Specific proposed "uses" should be reviewed for environmental impacts before implementation. Until EPA has opportunity to review these specific proposals, the Agency will continue to have environmental concerns.

2. Discussion of development and implementation of Best Management Practices (BMPs) is not very clear. BMPs are of value only if sufficient effort is devoted to establishing meaningful guidelines, and steps are implemented to insure compliance. Creation of the Northern Region Interagency Task Force on BMPs is a significant step in the right direction, but it is only the first step. To be effective, the BMPs will need to be incorporated into timber sale contracts, grazing agreements, mining activity, etc. and be compliance monitored.

3. Provision of $10,000 annually for water quality monitoring is terribly deficient. A budget of ten times that may still be on the low side. The Forest Management Plan should include an overall water quality monitoring program, and guidelines for additional monitoring related to each specific modificational use. EPA is very concerned that you presently do not, and will not have sufficient information to evaluate the adverse environmental impacts of the proposed "use" without a greater commitment to monitoring.

Department of Energy
Bonneville Power Administration
P.O. Box 3621
Portland, Oregon 97208

RECEIVED
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BEAVERHEAD N.F.
DILLON, MT

In reply refer to: SJ

MAY 3 1 1985

719

Mr. Joseph J. Wagenfehr
Forest Supervisor
Beaverhead National Forest
USDA Forest Service
Box 1258
Dillon, MT 59725

719-15-06

Dear Mr. Wagenfehr:

Our Office of Engineering and Construction has reviewed the Revised Draft Environmental Impact Statement (EIS) for the Beaverhead National Forest, and they offer the following comments.

Although the draft EIS does address both existing and proposed energy transmission corridors, we are greatly concerned about the lack of discussion of certain corridor issues, as listed below. We recommend that these issues be analyzed and then discussed in the final EIS in order to comply with the corridor planning requirements of the Federal Land Management and Policy Act (FLMPA) as well as the requirements of NEPA.

1. In addition to meeting the requirements of FLMPA, one of the main reasons for establishing corridor windows was to prevent needed utility and transportation corridors from being excluded by wilderness designation. The Beaverhead EIS states that the four unoccupied corridors which cross roadless areas are precluded from development, but it does not discuss the impacts of such preclusion. These impacts should be evaluated. Also, the EIS should evaluate corridor alternatives that would avoid these roadless areas, as well as the alternative of removing a section of roadless area from wilderness and designating it as a corridor window.

2. The goal of Phase I of the Pacific Northwest Long-Range East-West Energy Corridor Study was to find seven east-west oriented corridors that would ultimately be needed to transfer energy from the eastern Montana area to the West. The study was based only on physical/terrain limitations. After the study was completed and all the corridor segments were mapped, it became obvious that there were only seven major east-west corridors available. Since the study was completed, the Northwest power situation has changed dramatically, with power surpluses now being experienced, and the immediate need for east-west transmission greatly diminished. However, it is important to remember how fast needs can change, and to realize that the original East-West Corridor Study was based on a 50-year planning horizon.

United States Department of Agriculture | Forest Service | Beaverhead National Forest | P.O. Box 1258
Dillon, MT 59725
406/683-3900

Reply to: 1920

Date: *

Anthony R. Morrell
Environmental Manager
Department of Energy
Bonneville Power Administration
P.O. Box 3621
Portland, Oregon 97208

Dear Mr. Morrell:

We appreciate the time you took to review and comment on the Beaverhead National Forest Revised Draft EIS and Proposed Forest Plan. I'd also like to thank you for the documents you sent, giving us additional information about the potential corridors that have been identified in our area.

We have addressed the corridors issue to the best of our abilities given the information currently available on corridor needs. Your suggestions have been incorporated where possible in Chapter IV, Section T, of the the Final EIS and in Management Area Standards in the Final Forest Plan. Our potential for hydroelectric or biomass energy resource development, other than for small-scale, domestic use, is very low and, for this reason, is not addressed in the EIS.

The corridors you indicate are of particular significance will remain open and are addressed in Management Area #5 in the Forest Plan. Exclusion and avoidance areas have been identified in the Standards for each Management Area. We have not addressed corridor segment #34, because this segment does not lie on National Forest land.

We do not display existing or potential corridors on the Management Area maps due to the amount of other information that must be displayed. We do, however, have maps available in our planning records displaying the corridors, available for public review and for our use in implementation of the Forest Plan.

Our review of the Montana Power Company's "1985 Long Range Plan" did not identify any conflicts with that plan.

Sincerely,

Ronald C. Prichard
RONALD C. PRICHARD
Forest Supervisor

Since the study, four major east-west energy corridors have been eliminated. Three of those four proceeded through areas that are now designated wilderness, and the other one proceeded through what is now the Salmon River Recreation Area. This leaves only three potential corridors, two through the Missoula area and one through the Snake River Basin area. It can easily be seen that at $2 million a mile for a high capacity transmission line, additional detours would become extremely expensive to society.

Due to the elimination of the other four corridors, we believe it is imperative that the corridor segments leading to the Snake River Basin be left open, especially segments 32, 34-37, 38 and 39. Please keep in mind that the East-West Corridor Study only looked at major interties. There are many local and area energy needs that could also require use of these corridors.

3. The discussion of occupied and unoccupied corridors in Chapter IV, pages 43 and 44, does not address corridor segment R34. We have enclosed a table which indentifies this and other corridor segments, along with their corridor attributes.

4. In addition to major east-west corridors there is the potential for north-south corridors. One corridor which might affect the Beaverhead National Forest was evaluated in a comprehensive Intertie Corridor Study completed in April 1984. The study was cooperatively done by BPA and the major utilities involved. Other Federal agencies such as the Forest Service also participated. The corridor shown in the enclosed Intertie Corridor Evaluation Report was part of what was called the Inland Intertie Plan. Although intertie studies have concluded that this plan is not as desirable as western alternatives, northern segments of it may eventually be required to reinforce local transmission systems.

5. The management plan could be made much more useful by addition of a map showing existing designated corridors (those mentioned in Volume 1, Chapter IV, page 44) as well as corridor windows. If this is not practical, an alternative would be to show corridors and corridor windows on the individual Management Area Alternative display maps. We have enclosed a copy of our Area Office Transmission Map which shows the existing transmission systems in the area and also a map which illustrates the corridor windows identified by BPA and the Forest Service in the Long-Range East-West Energy Corridor Study completed in 1979.

6. We could not find what have been defined as "exclusion" or "avoidance" areas in the plan or the EIS. These areas are normally included in accordance with the Forest Service planning process.

7. If you have not already done so, we suggest that you consult with the Montana Power Company and the Vigilante Electric Cooperative regarding utility corridors.

---

8. We recommend that you include a discussion of potential energy resource development (particularly renewable resources such as hydroelectric, small hydroelectric, and biomass) in the management plan and EIS.

If you would like assistance from BPA in making a corridor analysis, we would be glad to help you. To request assistance or to obtain further information, please contact Timothy J. Murray, Chief of the Environmental Analysis Branch, at this address or at 503-230-4528 (FTS 429-4528). Thank you for the opportunity to review the draft EIS.

Sincerely,

for Nicholas J Stas
Anthony R. Morrell
Environmental Manager

6 Enclosures:
Table of Corridors Affecting Beaverhead National Forest
Intertie Corridor Evaluation Report
Map of Long Range Corridors
Map of Existing Transmission System
Proposed Forest Plan Supplement (loaned to BPA)
Revised Draft EIS (loaned to BPA)

cc:
Earl Reinsel, USFS Region 1, Missoula, Montana
J.W. Couture, Manager, Real Estate Department, Montana Power Company

State of Montana
Office of the Governor
Helena, Montana 59620

TED SCHWINDEN
GOVERNOR

RECEIVED
85 JUN 17 A8:45
BEAVERHEAD N.F.
DILLON, MT

June 14, 1985

777

Mr. Joseph Wagenfehr
Forest Supervisor
Beaverhead National Forest
P.O. Box 1258
Dillon, MT 59725

777-14-08

Dear Mr. Wagenfehr:

The State of Montana appreciates this opportunity to review and comment on the supplemental Draft Beaverhead National Forest Plan (Plan) and Environmental Impact Statement (EIS). Your agency's cooperation and presentation of the Plan to Montana's interagency planning task force and Ad-Hoc Forestry Committee are also appreciated.

The supplemental Plan has been improved considerably with additional information and expanded Forest Service Standards since the 1982 Plan. Several concerns regarding the Plan remain, however, including timber harvest levels, increased roading, elk security cover, water quality monitoring and recreational use. These and other concerns are detailed in the attached comments which reflect the task force's review of the supplemental Plan and EIS.

Sincerely,

Ted Schwinden
TED SCHWINDEN
Governor

Attachment

United States Department of Agriculture
Forest Service
Beaverhead National Forest
P.O. Box 1258
Dillon, MT 59725
406/683-3900

Reply to: 1920

Date: *

Honorable Ted Schwinden
State of Montana
Office of the Governor
Helena, MT 59620

Dear Governor Schwinden:

I appreciate the thorough review given our Revised Draft Environmental Impact Statement and Proposed Forest Plan Supplement by you and your staff. We have considered your comments and have responded, in the following pages, to the points raised in your letter.

Please note that we have "sectioned off" and lettered portions of your comments. These lettered "sections" are the specific points to which we have responded in our letter. You will find our response paragraphs lettered to correspond to your comments.

If, after reviewing our responses, you have questions or would like to further discuss some of these points, please feel free to call me at my office in Dillon.

Thank you for your continuing interest in our Forest Plan.

Sincerely,

Ronald Prichard
RONALD C. PRICHARD
Forest Supervisor

Enclosure

777-14-08

State of Montana
Office of the Governor
Helena, Montana 59620

TED SCHWINDEN
GOVERNOR

MONTANA COMMENTS ON THE 1985 DRAFT BEAVERHEAD NATIONAL FOREST PLAN AND ENVIRONMENTAL IMPACT STATEMENT

Overview.

Several improvements have been incorporated into the Beaverhead National Forest's (BHNF) proposed Forest Plan supplement (Plan) since the state's 1982 comment letter on the draft Plan. The reader can now evaluate the Plan in greater detail with the addition of Appendix D, Elk Logging Study, and Appendix F, Fire Management. In addition, the expanded Forest Standards provide the necessary specific information previously unavailable.

Although the proposed plan has been considerably improved from the initial draft, many concerns remain:

- The Plan does not appear to support the preferred alternative's goal in relation to future timber harvest levels on the BHNF.
- Projected signficant increases in road building may jeopardize the high quality watersheds and blue-ribbon fisheries on the BHNF, as well as nationally recognized big-game habitat and hunting opportunities.
- An already limited amount of important elk security cover could be further reduced through accelerated timber harvest proposals in selected areas.
- The Plan lacks an adequate commitment to watershed monitoring and inventory activities, including a failure to project sediment yield by individual watersheds.
- The Plan fails to include non-resident visitor projections when predicting recreation visitor days, thus significantly underestimating the anticipated increases in recreational use on the BHNF.

These and other concerns are detailed in the following comments:

1. Water Quality.

A The Big Hole River is the municipal watershed for the City of Butte, and therefore has a water quality classification of A-1 above the Butte Water Company intake upstream from Divide (ref. Administrative Rules of Montana, Chapter 20, Water Quality, Subchapter 6 - Surface Water Quality Standards). The A-1 water quality standard also applies to all tributaries to the Big Hole River above the Butte water intake. The BHNF Plan should acknowledge this water quality designation. At a future date, a cooperative municipal watershed management plan that encompasses all land uses in the basin may have to be developed.

In response to your 1985 Forest Plan comments:

A. The Forest Plan recognizes the fact that the Big Hole River is a municipal Watershed in the Forest-wide standards (Watershed #2); and in the Big Hole Drainage Chapter of the Forest Plan.

777-14-08

B More emphasis on watershed management planning is needed in the Indian and Rattlesnake Creek drainages, the municipal watersheds for Sheridan and Dillon, respectively.

C A category for water and soil monitoring and evaluation should be added to Timber, Recreation and Facilities. A water quality monitoring strategy, developed by location in various planning units, could help evaluate any water quality impacts resulting from timber sales, road systems and heavy use areas in the BHNF.

D A recent Forest Service summary report of the watershed policy and review for the northern region states that: "Watershed monitoring and inventory activities are presently being funded significantly below estimated low level needs. At present funding levels, monitoring activities will not be able to evaluate the effects of land management activities on soil and water resources, document compliance with legal requirements, validate coefficients and assumptions used in the planning process, or respond to public inquiries and appeals." In view of the tremendous values of the watersheds on the BHNF (Big Hole, Madison and Beaverhead Rivers), it is imperative that the Plan contain a clear commitment to responsible monitoring.

E The Plan should indicate that site-specific Best Management Practices (BMPs) will be developed, implemented and proven at the project level. Projects that cannot meet state water quality standards should be redesigned, rescheduled, or dropped. Suitable BMPs are especially important on the BHNF because of the valuable downstream fisheries. Road construction, silvicultural and range management guidelines in the Plan appear adequate to preserve water quality. Goals and guidelines for watershed rehabilitation are good.

Projected in-stream flows appear to be sufficient to maintain fish habitat, recreational uses and other beneficial uses of water on the BHNF.

2. Water Yield.

F Timing of runoff continues to be a concern of the state. Increased water yield in the spring without additional storage capacity may equate to lower flows during critical parts of late summer. Moreover, uncontrolled increased flow also means increased sedimentation. This has obvious implications for off-forest, downstream irrigators and to stream fisheries. Portraying increased water yield as a benefit of timber management must be clarified in the Plan with a consideration of timing and storage capacity.

3. Sediment.

G Sediment yield calculations being used in the BHNF Plan could be understated by several orders of magnitude. As was identified in the state's 1982 comments on the Plan, sediment yield calculations are of little value unless they are generated for individual watersheds. This is confirmed by the USDA Northern Region Guide to Predicting Sediment Yield from Forested Watersheds (October, 1982, p. 3) and is of particular importance in the Big Hole watershed where extensive roading and logging are planned.

B. In the Forest-wide Standards (Watershed #2) specific direction is provided relative to the Watershed Management Plans for the Indian and Rattlesnake Creek drainages. These plans are incorporated into the Forest Plan as appendices and will be implemented. They will be revised and updated as needed.

C. Water and soil monitoring and evaluation is an essential facet of Forest Plan monitoring. The Forest Plan Monitoring Requirements present (Forest Plan, Table VI-1) the strategy we will use in monitoring the effects of Forest Plan implementation on soil and water quality and quantity, and the effectiveness of the predictive models that are used at the project level. Monitoring items are presented in the "Watershed" and "Soils" categories rather than under "Timber", "Recreation" and "Facilities."

D. The Forest Service expresses commitment to the importance of water quality monitoring through the Forest Plan direction and in the programming and budgeting phases of Forest Plan implementation.

E. The Forest Plan indicates that "Best Management Practices" (BMP's) will be developed and implemented at the project level in the Forest Objectives (section C); Forest-wide standards (Watershed #4, Soils #1, Range #10, and Facilities #2); and Management Area standards. In addition, specific BMP's are included as Forest-wide or Management Area standards, for example, "Yarding across live streams will require full suspension of logs" (Timber #18). The Forest Plan IMPLEMENTATION Chapter, Section C indicates that:

> As part of project planning, site specific water quality effects will be predicted and evaluated and control measures designed to ensure that the project will meet Forest water quality standards. Projects where analysis indicates that, even with mitigation measures, Forest water quality standards can not be met will be redesigned, rescheduled, or dropped from the program.

Furthermore, the Monitoring Requirements show that critical monitoring elements in both the Watershed and Soils elements address the effectiveness of BMP's utilized on project activities.

F. We did not mean to imply that timing and storage capacity were not critical factors in evaluating potential benefits associated with water yield. We have reviewed statements in the EIS (Chapter IV) to ensure that the correct message is conveyed.

G. Sediment yield, although aggregated up to planning units for planning purposes, was calculated based on coefficients established for each Geographical Display Area. These areas usually contain one main drainage with two to four secondary drainages and few to many first order streams. Thus, there may be numerous small watersheds in the area but just one drainage. For Forest planning objectives this is the most efficient approach. Currently we are restructuring our data base as well as beginning a monitoring program that will enable us to calculate sediment production on an individual drainage basis. Once we have this capability, we will spatially locate the selected alternative management assignments and will determine the resulting impacts on 250 drainages on the Forest (approximately 75 percent of the land area). This will put us in a much better situation to assess the project impacts on watershed and fisheries by determining the amount of harvest and roading that can take place in a drainage before the sediment thresholds are reached.

H Land management practices in the West Fork Madison River drainage also warrant careful consideration. Sediment from roads and natural erosion contributes a major portion of the sediment load in the Madison River. Timber harvest schedules, harvest methods and road construction should include BMPs to minimize water quality impacts in both the West Fork and mainstem Madison drainage.

I While sediment yields appear to have been made for roads projected in each alternative, it is unclear whether sediment yields are based on the number of new miles or acres of land disturbed by road construction, or based on the total number of miles of roads on the forest. Sediment yield from road construction in the Big Hole drainage is of particular concern, since more than 60 percent (over 1,450 miles) of the projected miles of new roads will be in the Wisdom and Wise River Districts. Clarification of the current roading situation as related to sediment yield is necessary.

J K When considering road closures, the extent of degradation (erosion) on new and/or rehabilitated road surfaces should be considered. Since roads are a major source of sediment, eventual impacts on stream courses may occur. A category addressing periodic road surface monitoring should be included in Item F (Plan, p. 169).

4. Tourism and Outdoor Recreation.

a. Alternatives.

L Despite the development of different alternatives, anticipated recreation use and costs are identical in each. This infers that recreational use is constant despite management direction, and is not a function of roads, timber harvest, or any other management action. It also infers that use will increase linearly over time, regardless of the alternative chosen. Because recreation is an important use of all Montana National Forests, including the BHNF, the alternatives developed should reflect a range of recreation options, rather than treating recreation as a static resource.

b. Recreation Capacity and Quality.

M Recreation capacity both for dispersed and developed recreation is stated to exceed projected demand through the fifth decade. This conclusion needs to be supported with quantified data, especially since excess capacity seems to be used to justify the decision not to improve or construct additional recreational facilities. We suggest the BHNF maintain the flexibility to respond accordingly if levels of use exceed expectations.

N Even with excess capacity, the quality and availability of the recreation experience and opportunities can be improved. As the DEIS acknowledges, capacity of an area to accommodate recreationists should not be equated with quality, since quality is associated with setting and improvements. Unfortunately, investments for new recreational improvements are minimal in the Plan, even though many of the existing sites are at or near capacity level at certain times.

H. Timber harvest methods and road construction in the West Fork of the Madison River as well as elsewhere on the Forest will incorporate Best Management Practices. No additional harvest, with the exception of a sale returned to the Forest Service through the "buy back" legislation will occur in the West Fork until the early 1990's or until regeneration allows us to comply with our water quality and wildlife standards.

I. We have clarified our discussion of road construction in Chapter II of the EIS. Sediment yields are based on the number of acres of land disturbed by road construction as a function of miles to be built plus the amount of sediment generated through continued maintenance of the new and existing roads.

Miles of new road construction is simply a function of acres to be managed for timber and not an independently derived objective. Given existing logging technology, a certain density of road is necessary to manage a certain acreage. Already new technology particularly useful in lodgepole pine stands is being used on the Forest that reduces the mileage of road needed for timber management. Over time we may find that additional road construction projections are higher than experienced.

Finally, relative to the Big Hole drainage, a reduction in the acres suitable for timber management resulted in a reduction in the projected miles of road to be built and an associated reduction in potential sediment yield.

J. Road management considers year-long closures and seasonal restrictions measures that can be used to prevent road surface degradation. Spring closures are currently implemented throughout the Forest for this reason.

K. We do not abandon maintenance of closed roads, unless we revegetate the road and "put it to bed." To the extent practical, we maintain the erosion control measures that were installed as the road was constructed. Many closed roads are used as trails and are maintained as such to avoid erosion. Maintenance of roads and trails is monitored in accordance with items 8-2 and 8-3 of the Monitoring Requirements.

L. Anticipated recreation use measured in Recreation Visitor Days (RVD's) is an assessment of "demand." This does not vary between alternatives because in all alternatives recreational capacity exceeds demand and we measure only up to the "demand level." Anticipated costs in the EIS are for developed recreation--these do not vary between alternatives because the number of developed sites remains unchanged. Again, since capacity exceeds demand, there was no need to increase the number of developed facililties.

The alternatives do vary significantly in the "unquantifiable" aspects of recreation (discussed in section 18 of Chapter II for each alternative). The diversity and quality of recreational opportunities, the amount of roaded, wilderness and roadless acreage available for recreational activities, and the degree of emphasis on associated resources (visual quality, wildlife, and fisheries, for example) varies between alternatives.

M. While existing estimates of "demand" and capacity for recreation are quantified using the best available data, in the future improved information may be available. In 5 years the Forest Plan will be updated, and in 10 to 15 years it will be revised, affording us the opportunity to respond if levels of use exceed expectations or if new projections or estimates are available.

Forest planners should consider developing alternative facilities near damaged recreation sites rather than attempting to impose use restrictions that may be hard to enforce. Development of alternative sites would allow the damaged sites to recover and would provide additional recreational opportunities to meet future demand.

c. Trails.

O The Plan does not indicate the amount of existing trail mileage that will be lost to increased road building. There is a possibility of decreased total trail mileage. Further, funds appear limited for new trail construction, since new construction of recreation facilities will be minimal. These items should be clarified in the Plan.

P A BHNF standard provides that the maintenance and protection of National Recreation trail corridors will be considered in transportation planning. The standards should be broadened in the BHNF Plan to include all recreation trails.

d. Recreation Use Projections.

Q It is erroneous to assume that increased recreation visitor days (RVDs) is a function only of Montana's population. Recreation projections should be based on both Montana population trends and non-resident visitor projections. Increasing numbers of non-residents are projected to visit Montana to avail themselves of outdoor recreation, particularly since similar opportunities are diminishing in other states. RVDs are therefore likely to be significantly underestimated. The Montana Department of Commerce can assist the Beaverhead Forest in developing revised projections for inclusion in the Plan.

e. Recreational Values.

R The values shown in the DEIS for Wilderness and other dispersed recreation visits (Appendix B, Table B-5) appear low, particularly relative to the other forms of listed recreation. More information should be provided to show how the BHNF determines these values.

f. Visual Quality.

The different treatment of visual quality costs and benefits places visual quality protection at a distinct disadvantage in the decision-making process to balance resource uses. The calculation of Present Net Value (PNV) regards visual management as a quantified monetary cost and reduces PNV accordingly (DEIS B-55), yet the visual quality benefits are not addressed in PNV (DEIS B-55). Instead they are obscured (or lost) in the non-quantified, net-public value narrative. S While we recognize the difficulty in quantifying visual quality benefits, the Plan must provide a more clear discussion of these benefits. This is required to balance the discussion of values assigned to visual quality.

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N. The Forest Plan does not project need for construction of new developed facilities, however funding is programmed for reconstruction and rehabilitation. In addition, the Forest Plan highlights the need for trail head facilities, sanitary facilities and trail facility reconstruction. Funding is programmed accordingly.

The Forest-wide Recreation Standards address dispersed recreation areas that may be suffering resource degradation. A range of management options are available, including development of alternate facilities and encouragement of their use.

O. While existing trails will be impacted through road construction, it is impossible to accurately predict the miles impacted because specific future locations of road are unknown. Furthermore not all existing trails are significant to our recreation management objectives. Generally, those that are significant are in areas where timber harvest and road construction are not scheduled to occur. The Forest-wide standards that addresses your concern (Trails #1 and #2) provide the flexibility necessary to determine if the benefits associated with the trail are significant and, if so, how the trail will be maintained.

Funds are earmarked primarily for trail reconstruction on the assumption that through the next ten years, that will be the Forest's highest priority in trail management.

P. As noted above, Forest-wide standards Trails #1 and #2 address this concern.

Q. Appendix B of the EIS indicates that recreation use projections are a function of population trends and historic use trends (resident and nonresident visitors are included). As noted in above (response M), revised projections can be adopted in the future should better information become available. We appreciate the offer of assistance!

R. Recreation was valued in two ways in our analysis - by valuing use at the point of entering the Forest ("willingness to pay values) and by valuing the influence of recreation use on the economy of the affected counties (Final EIS, Appendix B, Section V, Social and Economic Impact Analysis). The "willingness to pay" values were developed for the 1980 RPA Assessment, and are based on research conducted throughout the country. They represent what the average person would be willing to pay for a Recreation Visitor Day (RVD) if the Forest charged a fee for that recreational activity.

The recreation value used in the socioeconomic analysis includes other expenses the visitor would have to pay (groceries, lodging, gasoline, and so on), thus portraying the influence of the RVD on the economies of the local counties. (Please refer to Appendix B for a more detailed explanation of recreation valuing and the social and economic impacts analysis.)
The values displayed in the EIS are "willingness to pay" values developed for the 1980 RPA Assessment. They are based on research conducted throughout the country and represent what the public is willing to pay for an RVD of recreation (wilderness, hunting, fishing, developed site and so on) at the entry point. It is what the average person would be willing to pay if the Forest Service charged a fee for that recreational activity. This is additional to other expenses the visitor would have (hunting license or equipment for example). It does not include the economic value of an RVD of use to the local economy. The values vary somewhat depending upon the location, but these values were used consistently throughout the Northern Region.

Site specific visual quality objectives should be developed for particular projects as outlined in the plan. The National Recreation Trail corridor management area contains good scenic management goals. Timber harvest in this area should be scheduled only as appropriate. Goals and guidelines for the Rock Creek dispersed recreation area are good.

g. Access.

T Separate motorized and non-motorized use areas should be designated in the proposed recreation management areas to reduce user conflicts. Existing and developed roads may be used for cross country skiing, hiking, horseback riding or handicapped access even if they are closed to vehicle access.

5. Wilderness.

U The preferred Plan proposes to add 156,600 acres of wilderness to the BHNF in the North Big Hole, West Big Hole, Italian Peak, Storm Lake, and East Pioneer areas. We urge the planners to reconsider the Governor's May 10, 1984 wilderness recommendation to the Montana Congressional Delegation for a 215,965 acre addition to the BHNF portion of the wilderness system as follows:

Area	Acres
1001 North Big Hole	31,260
1008 East Pioneer	89,650
1943 West Big Hole	79,300
1945 Italian Peaks	12,907
	215,965

V A detailed discussion of the wilderness values of these areas from the Governor's 1984 wilderness recommendations is attached for your consideration. Timber management activities proposed in the Plan for these areas should not be implemented until congressional action has resolved the wilderness issue on the BHNF.

W The Plan projects roadless management for approximately 1.1 million acres, in response to public desire for such management. However, this acreage may be reduced by roads accessing isolated timber sales. The effects and the potential location of this type of roading on roadless lands should be described in the Plan,.

6. Range.

Range management goals and guidelines proposed in the Plan are generally good, especially for riparian areas and moist sites. Range condition and trend are the appropriate basis for management decisions. Range improvements, particularly in riparian areas should be implemented where necessary to protect other resources.

Requiring all allotments in the BHNF to be under a planned management system is an excellent goal. Carefully planned management following rest-rotation principles will minimize conflicts between livestock and wildlife.

S. The benefits associated with maintenance of visual quality are addressed in several portions of the EIS, notably Chapter II, section 18. We did not intend to obscure the importance of visual quality.

The Forest Plan devotes an Appendix to display those areas on the Forest where visual sensitivity is high and visual quality will be maintained. Generally those areas are campgrounds, trails, highways and important Forest system roads, and areas seen from communities.

T. Motorized and nonmotorized use areas are designated through the Southwestern Montana Interagency Visitors' Map, incorporated as an appendix to the Forest Plan. Travel management will reflect Forest management goals and objectives and management area direction and ensure that a full array of recreation opportunities are available on the Forest.

U. We reconsidered our proposals for wilderness classification while reviewing the public's comments. We have increased the acreage included in the Italian Peaks Wilderness but have not expanded the acreage encompassed by the other areas we recommended for classification. Detailed rationale for our wilderness recommendations is included in the Record of Decision.

V. Upon approval of a Final Forest Plan by the Regional Forest, we intend to begin implementation of all aspects of management activities scheduled by that Forest Plan. Those roadless areas released from wilderness consideration by completion of a Final Forest Plan will be available for other management activities. This includes timber management activities.

W. The effects of roading on areas where road construction is not scheduled but where it could occur to access timber management areas is included in the information presented in the EIS, Appendix C. Each roadless area discussion estimates the acreage that will remain unroaded in 10 years and in 50 years.

X The Plan states that 35 percent of the available forage will be left on wildlife winter range. It is unclear whether this means that 35 percent of the range will not be grazed, or that 35 percent of the plant foliage will remain. Light grazing by livestock early in the season has been shown to improve forage quality on wildlife winter range, but 65 percent utilization is heavy on any range. Wildlife winter range should be managed to maintain or increase the carrying capacity for wildlife and reduce damage to adjacent lands during harsh winters. The option to increase or decrease the percentage of utilization, depending on the site, through an agreement between the BHNF and the state (after an on-ground inspection) is acceptable.

The standard restricting livestock developments on secondary range is commendable.

X1 Forage utilization levels of 55 to 60 percent in managed pasture systems may fall within acceptable limits of cattle grazing and range improvement. However, some small game and non-game animals that have home ranges primarily restricted to these pastures, may suffer significant loss of security cover.

X2 Prescribed burning should be carefully planned, implemented and evaluated to insure that the range project objectives are met. Burning may increase forage quality, availability and production, but it will also favor sprouting trees and shrubs and may encourage weed invasion. Reseeding may be necessary on projects where the ground is disturbed, and may be desirable for burned areas to help prevent weed invasion.

Y The Plan needs greater emphasis on a weed program to both confine and control present infestations. It should contain a commitment to using the best combination of cultural, biological, mechanical and chemical control methods. Any herbicide applications should be carefully planned and conducted to protect desirable plants and state waters. While weed control may not be economically feasible on all BHNF lands, preventing the spread of weeds to adjacent lands should be an important consideration in the Plan.

Z An Integrated Pest Management (IPM) approach should be used in all BHNF predator and rodent control programs to insure that control efforts are justified, and that a full range of control methods are investigated. The Plan should contain a commitment to coordinating these programs with the Montana Department of Agriculture, Montana Department of Livestock, county rodent control supervisors, the Montana Department of Fish, Wildlife and Parks and the U.S. Fish and Wildlife Service.

AA We support the proposed riparian grazing prescriptions identified in the Plan. However, given that there appears to be no budgetary commitment to additional manpower and monitoring in the BHNF we question whether the program can be successfully implemented. This is particularly important in view of the proposed increases in grazing animal unit months (AUMs) on the forest, and the anticipated increases in catchable trout on the BHNF.

BB It would be helpful if the Plan included an inventory of the areas on the BHNF considered in need of watershed rehabilitation or reforestation.

X. The Forest-wide standards Range #9 has been revised to address this concern.

X.1. Through the interdisciplinary process, we will identify specific objectives for Allotment Management Plans. Specific objectives may include maintenance of habitat for small game in certain areas, maintenance of riparian values, maintenance of elk winter range, and so on. The utilization standards to which you refer are specified as "maximum" use anticipated. Use may be less in some instances, if we identify other priorities or needs within the allotment.

X.2. An interdisciplinary team will carefully evaluate all areas that are to be treated by prescribed burning. In some areas we may have to seed with an appropriate seed mix required after burning if the remaining cover is insufficient to ensure adequate ground cover and/or to prevent undesireable plant invasion. In most instances we will conduct prescribed burning to improve overall rangeland values, not just to improve forage production for domestic livestock.

Y. The Forest Service commitment to noxious weed control is expressed in the Forest objectives and Forest-wide standards. An "aggressive...program will be continued and expanded..." and will be "coordinated with adjacent landowners and other controlling agencies." We concur that prevention of the spread of weeds to adjacent lands is an important facet of our program.

Z. This concern is addressed by Forest-wide standard Wildlife #5.

AA. We have developed a funding proposal for Forest Plan implementation and monitoring which will allow us to successfully implement the program. An important facet of monitoring will be the degree to which the actual budget received and accomplished reflect the Forest Plan program. If we find through monitoring we have not successfully implemented the Forest Plan, changes will have to be made with appropriate public involvement.

BB. The Beaverhead National Forest does not have a reforestation backlog.

Areas in need of watershed rehabilitation are included in Management Area 27 and displayed on the Forest Management Area maps. In addition, Appendix N lists a program of watershed restoration projects.

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7. Timber.

We are concerned that the preferred alternative may not meet its stated goal of balanced resource management on the BHNF. The DEIS states that:

- "timber offered will be near current levels"; and,
- "the impact on local employment in the timber industry would be to provide about the same number of opportunities currently provided."

The following information from the Plan appears to conflict with the above statements:

- o The proposed level of timber to be offered for sale will be 27% below the average offered since 1978, and lower by 13-41% than any individual year since 1978.
- o There would be a loss of from 151 to 217 jobs, and a loss of from 3.3 to 5.5 million dollars in personal income in the first decade, depending on whether the figures used for the preferred alternative are from Table B-7 or II-13.

CC The Plan should more clearly identify the rationale used by the BHNF in determining that the proposed future timber harvest levels contribute to a balanced alternative for management.

DD The Plan did not assess the proposed timber sale level relative to expected cuts on private lands, nor did it identify the past relationship between the amount of timber offerred, sold and harvested. These analyses are necessary to clarify the BHNF's relative position as a timber supplier in the local area, and to make it easier to assess the impacts of the proposed lower sale level on the local economy.

EE It is unclear in the Plan why nearly 35,000 acres of non-forested sites and non-commercial forest areas are included in management areas with a timber emphasis. These unproductive and likely uneconomic sites should be reclassified unless unscheduled sanitation or salvage operations are anticipated. Additional discussion of potential unscheduled timber harvests in the Plan would be helpful.

FF An ambitious pre-commercial thinning program is described in the Plan as the apparent basis for a projected three-fold increase in timber yield in future decades. We question the ability of the BHNF to accomplish the projected tripling of yield:

- The technical basis for the projection (literature citations of local studies) should be included in the Plan.
- Full funding of the proposed BHNF thinning program is uncertain (as with all programs).
- The Bitterroot National Forest, which shares a common boundary with the BHNF, has concluded that pre-commercial thinning results in very little increased yield.

CC. The rationale used by the Regional Forester in deciding upon the Selected Alternative for management of the Beaverhead National Forest is presented in the Record of Decision. It is impossible to summarize the rationale here without losing some important content. In brief, however; the management goals for the Beaverhead National Forest emphasize wildlife, fisheries and water quality. Within the standards and land use designations designed to protect and enhance these resource values, other resouce uses are emphasized.

DD. In the "Analysis of the Management Situation" (AMS) we considered the relationships you refer to. (The AMS is available for review in the planning files at the Supervisor's Office in Dillon.) The socioeconomic impacts of the lowered harvest level are addressed in Chapters II and IV of the Final EIS.

EE. The suitable timber lands and timber harvest levels are calculated based on only those acres of the Forest that are forested and tentatively suitable for management. Thus, in a section of 640 acres, 515 might be suitable with timber yields calculated from those acres. When mapping the land use designations including those Management Areas suitable for timber management, it was impossible to map in any meaningful way only those acres in the section that were suitable. Therefore the whole section was assigned to a suitable Management Area, with specific reference made to the acres within that designation that were nonforested.

FF. In the Draft Forest Plan, timber volumes increased 38 percent over 150 years, not threefold. Therefore we are uncertain as to whether your concern still applies.

We have programmed funding to support the thinning program described in the Forest Plan. We have assumed that thinning in a managed stand can improve yields over an unmanaged stand. The reference(s) appropriate to support of that assumption have been included in the EIS. When the Forest Plan is revised in 10 to 15 years, assumptions about yields and the effects of the precommercial thinning program will be reassessed. The experience gained from Plan implementation will be used to adjust projected increases in timber yield if adjustments are needed.

It appears that significant revisions in future plans may be necessary if the projected increase in timber yield does not occur. The Plan should consider this possibility.

GG Shorter rotations for lodgepole pine (to manage mountain pine beetle infesta-
tions) may prove more economical, and might reduce road construction and
old growth timber harvest in the future. The Plan should identify proposed
HH conversions of vegetation types from lodgepole to Douglas-fir, or from timber
or sagebrush to grassland, to allow public review.

Insect and disease control guidelines in the Plan are good. We encourage IPM strategies in project analysis and design on the BHNF.

Preventing insect and disease epidemics by managing timber stands, pre-commercial thinning, adjusting rotation ages, and converting to less susceptible species is an excellent strategy that should be continued.

II The Plan should address the removal of firewood, as firewood gathering may represent a significant use of timber in some areas. Roads could be left open and logging slash yarded to facilitate firewood gathering, provided that conflicts with other resource considerations, such as wildlife and water quality, could be minimized.

8. Economics.

JJ The stated goal of the preferred alternative (p. II-28) is "...to maximize present net value while responding to the range of resource use demands and concerns of the public who utilize the BHNF land and resources." Given the range of outputs displayed for the various alternatives on p. II-115 (Table II-13), it is questionable whether this goal has been met. For example, when compared to all the other alternatives, the preferred alternative has the second lowest present net value (PNV). The preferred alternative is either low or the lowest of the alternatives in market benefits and economic values, while being one of the highest for non-market and aesthetic benefits.

KK Forest receipts for the period 1978-83 averaged about $371,000 per year (p. III-5). Table II-13 projects average annual receipts for the first decade of $2,662,000. The reason for this discrepancy is not readily apparent, but appears to be related primarily to the stumpage prices used in the projections. The BHNF should consider recomputing the Plan's economic analysis based on more realistic stumpage values. Such an analysis could lead to a different conclusion on how best to maximize present net value.

On p. II-79 it is stated that, "Returns to the State and local governments in the first decade for all alternatives are higher than the 1980-1982 average returns." The returns from the preferred alternative are the lowest of all the alternatives. In addition, it is questionable whether the projected return increases can be achieved given the historic rate of increases. Regardless,
LL the impact on the quality of the schools and roads in Beaverhead and Madison
counties as a result of the projected BHNF returns should be addressed in
the Plan.

GG. We have considered shorter rotations for lodgepole pine stands and do permit harvest prior to culmination of mean annual increment to address potential mountain pine beetle infestation. However, this strategy contradicts our standards regarding water quality and fisheries habitat protection and is impossible given our standard that ensures maintenance of big game hiding cover (Timber #11).

HH. The Final Forest Plan does not provide for conversion of vegetative type but does permit type maintenance; for example, where Douglas-fir has encroached on grassland vegetative communities (Forest-wide standard Timber #19). The NEPA process will be complied with, including "scoping" with appropriate public involvement.

II. Forest-wide standard Timber #14 and Management Area standards address this concern.

JJ. As discussed in the Record of Decision, we believe the selected alternative does maximize present net value while responding to the range of resource use demands and concerns....The evidence gathered through the Forest planning process and public involvement indicates the resources on the Beaverhead National Forest perceived to be most significant are the nonmarket "amenity' resources, not those assigned market values in the Forest planning analysis. The selected alternative is responsive to this input.

KK. The Forest planning analysis used information for 1968-1979 for the projection of timber values in the EIS. Since timber values fluctuate and are dependent on a number of supply and demand factors, any projection must be recognized to be an estimate based on historic trends and future expectations. Following the public review of the Revised Draft EIS, we reevaluated the Proposed Forest Plan's land use designations and timber harvest program using a different set of timber value assumptions. These incorporated the most recent "low" years for the timber industry as well as the "high" years of the late 1970's. We found that projected timber values were lower than used in the DEIS, resulting in lower timber receipts. Still, for the Forest, timber receipts exceeded costs of timber management over the planning horizon. However, economic efficiency did vary depending upon the scheduling of activities.

Based on this "sensitivity analysis" we will be closely monitoring some lands where, depending upon the assumptions about timber values, costs of management could exceed economic benefits. We believe the selected alternative best maximizes present net value while responding to the range of resource use demands and concerns of the public who utilize the Forest.

(For further information about the sensitivity analyses, refer to Appendix B, Section IV, Part 3.a. of the Final EIS.)

LL. The impact the Forest Plan has on local counties has been discussed in terms of 25 percent fund payments in Chapter II of the EIS. To expand upon this, into description of impacts on local schools and roads, would require assumptions about the ways local counties manage, distribute, and utilize those funds. That is beyond the scope of this analysis.

Statements have been incorporated into the economic benefits discussion in Chapter II noting that different assumptions about timber values, grazing receipts, or mineral receipts would result in different calculations of benefits.

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	As suggested previously, the preferred alternative should be re-evaluated in relation to whether it meets its stated goal and represents a balanced management direction. At a minimum, changes should be made in the preferred alternative to ensure that any reductions in returns to the state occur gradually, allowing reasonable time for funding adjustments at the state and county level.	
MM	The percentage of total employment represented by wood products in the local and state economy should be included in the discussion of economic setting. The description of economic setting in the DEIS (p. III-4) includes a discussion of the various sectors of the economy, most of which are described in terms of the percentage of total employment they represent. These are compared to state-wide percentages to provide a measure of relative importance in the local economy. These descriptors of the economy are useful, but unfortunately no percentage information is provided for the wood products sector. Consequently, it is difficult to obtain a sense of the importance of the wood products industry in the local economy.	MM. Your concern has been addressed in the Chapter III of the Final EIS.
NN	Non-market benefits are displayed (Table II-13, p. II-116) as being identical for all alternatives for each decade, through decade 15. It is difficult to understand how non-market benefits can be the same over the full range of alternatives, and then increase in equal increments through future decades. This occurrence should be explained. Discounted benefits for recreation/wildlife are also shown as being the same for all alternatives. With each alternative having a different recreation/wildlife emphasis, it is difficult to understand how the benefits can remain the same. This needs to be explained as well.	NN. Nonmarket resource benefits that have been assigned dollar values in Forest planning are the recreation/wildlife benefits. This is explained in Chapter II of the EIS in section 16. As noted in response "L", recreation use and associated valued benefits are measured only up to the demand level which all alternatives exceed. Thus all alternatives provide the same level of valued ("demanded") recreation benefits.
OO	A fisherman day value of $5.25 in the DEIS is much too low. Recent economic analyses in Idaho have placed the value of a fisherman day in the vicinity of $30.	OO. Please refer to response "R" for an explanation of the way in which the "fisherman day (RVD)" value was developed.
	A number of significant errors or inconsistencies are present in the DEIS, usually in the display of outputs from the preferred alternative. The following points should be corrected or clarified.	
PP	- There is a significant discrepancy between Table II-13 and Table B-7 in regard to the figures displayed for employment, income, returns to the treasury, and returns to the State.	PP. The discrepancies between Table II-13 in Chapter II and Tables B-7, B-8, and B-9 in Appendix B relative to the Alternatives H, HA, and H (Dept.) have been corrected.
QQ	- The PNV values displayed for alternatives H and HA 8 are inconsistent among Tables II-13, B-17 and Summary-15.	QQ. These discrepancies have been corrected.
RR	- On page II-31 of the Draft EIS, it is stated that the PNVs of alternatives H and HA are "4th lowest of the alternatives." This conflicts with Table II-13 which shows alternative H having the second lowest and HA having the third lowest PNV.	RR. This error has been corrected.
SS	- The bar graph (Figure II-23) on p. II-73 shows an incorrect value for alternative HA. According to p. II-31 "approximately 2,925 miles of additional roads are needed..." under alternative HA. The bar graph shows less than 500 miles.	SS. This oversight has been corrected.

TT - In Appendix H of the Plan, the heading for Table H-1 is "Beaverhead National Forest 10 Year Timber Sale Program," but only nine years are listed.

UU - The future price for wildlife viewing in the year 2015 (Draft EIS p. B-52) appears to be a typographical error.

9. Roads.

The Plan projects that the preferred alternative may result in the construction of 2,448 miles of new road on the BHNF in the next 50 years, a 145 percent increase in total road miles. An increase of this magnitude has the potential to adversely affect several major resources of the BHNF, including water quality, fisheries, wildlife and recreation. Our concerns regarding increased roading are detailed in each of the comment sections for these items.

VV The future goals and policies for the BHNF's proposed road management program should be identified and discussed in greater detail in the Plan. All new roads in some may require closure following harvest to provide necessary protection for watershed and wildlife values. The reason the Plan proposes to close 75 percent of new roads (forest-wide) following timber harvest is unclear.

We appreciate the BHNF's use of the Interagency Travel Plan to keep the public aware of current road management policies.

10. Fisheries.

WW As pointed out in our 1982 comments, lake and stream fish should be treated separately in discussion of the various alternatives. Combining them tends to downplay the level of impact on streams. Habitat alterations caused by forest activities primarily affect stream trout that account for only 166,000 of the total of 750,000 fish estimated for the BHNF.

a. Fishermen Use.

XX The fishery use (1980 output) estimate of 48,700 RVD's appears to be low. A mail survey conducted by the state for 1982-83 showed that nearly 25,000 fishermen days of recreation were provided by Cliff, Wade, Elk and Reservoir Lakes alone. It is unlikely that these four lakes provide half of the fishing pressure for the BHNF.

We also question the number of days assigned to water based recreation on the forest (134,700 RVDs) when compared with fishing recreation (48,700 RVDs). It is unlikely that fishing constitutes only 26% of the recreational attraction to water on the BHNF.

b. Downstream Fisheries.

YY The economic importance of fishing on rivers draining the BHNF should play a significant role in land allocation decisions in the Plan. Headwater streams originating on the BHNF contribute flow to several of the

TT. The 10 year Timber Sale Program in the Forest Plan now encompasses 10 years.

UU. The value for wildlife viewing in the year 2015 should be $38.57.

VV. The goals, objectives, and standards which guide the Forest's road management program have been described further--in Goal #9, Objective O, and Forest-wide standards Roads #8, #9, #10, #11, and #12 of the Forest Plan.

As presented in Chapter II, Section D, Part 11 of the Final EIS, generally 75 percent of the newly constructed roads will be closed to provide elk security. This approximates the results of the Forest's standards regarding elk effective cover. Monitoring will determine whether meeting Forest standards results in 75 percent closure, or more or less.

WW. We have corrected the EIS to ensure that lake and stream fish habitat potential is displayed separately.

XX. Fisherman days and recreation visitor days (RVD's) are calculated differently. Therefore, the data from the State of Montana survey is not directly comparable with the 1980 estimate of RVD's. Furthermore, the years are different.

Our estimates of recreation use are based on the Forest Service's Recreation Information Management (RIM) system. While we recognize the system has flaws, it provides the best information available regarding on-Forest recreation activities. Monitoring and continuing collection of RIM data will provide, with Plan updates on revisions, the opportunity to correct any errors and/or update information.

YY. The importance of the downstream fisheries resource has been recognized in the Selected Alternative and Forest Plan (see Forest Goal #2 and Objective B). Downstream fisheries is addressed in Chapters II and IV of the Final EIS relative to potential for recruitment of adult fish to downstream fisheries and potential for impacts to that recruitment under each alternative. The influence of downstream fisheries considerations is further described in the Record of Decision.

highest quality trout streams in the country, and provide essential spawning and rearing areas for mainstem rivers outside the forest. Thus, the quality and quantity of water leaving the BHNF is the key to the health of downstream fisheries. The Madison, Big Hole and Beaverhead Rivers support in excess of 200,000 fishermen days of use annually. Nearly 50 percent of this use is by non-resident fishermen who contribute significantly to Montana's economy. A recent study shows that the Madison River fishery generates in excess of ten million dollars annually.

ZZ An attempt is made in the DEIS to quantify potential recruitment of tributary stream fish populations to downstream rivers. We commend this effort, but question the 49 parts per million (ppm) total suspended sediment (TSS) value used as a baseline. The Clark Fork River, notoriously high in sediment load during runoff, carries only 25 ppm TSS during high water. We suggest that baseline TSS figures on the BHNF should be in the vicinity of 10 ppm.

AAA Neither the Plan nor the DEIS discuss the effects of projected increases in water yield on channel stability of tributary streams or the effect of increased runoff peaks on late summer flows. Changes in stream flow patterns could have a significant impact on fish habitat and should be discussed in the documents.

c. Indicator Species.

BBB A review of the Geographical Display Areas in the 1982 Plan reveals that stream dwelling grayling were not acknowledged in the Big Hole or Pioneer units, and westslope cutthroat were not acknowledged in the Pioneer, Lima or Gravelly units. Both species should be listed as indicator species in streams. The stream dwelling grayling population of the upper Big Hole should be an issue of concern under all management practices and alternatives in the Wisdom and Wise River Districts.

d. Big Hole Drainage.

Over the next decade, two-thirds of the timber harvest for the BHNF is proposed to come from the Big Hole drainage. The Big Hole River today is one of the few rivers in Montana that remains "fishable" during the runoff period because the water remains clear. The high water period of mid-June coincides with the salmon fly hatch which attracts large numbers of anglers to the river. Extensive road building and timber harvest proposed in the headwaters could increase sediment during the high water period and adversely affect recreational fishing during the salmon fly hatch. Given the level of uncertainty associated with sediment yield predictions and the high recreational value of the area, it would appear prudent to allow a greater degree of flexibility in the proposed rate of timber harvest in the drainage. CCC

e. Habitat Improvement Projects.

Throughout the Plan, habitat improvement structures are offered as mitigation for predicted loss of fish due to increased sedimentation. In most cases, however, not enough is known about fish populations within

ZZ. The 49 parts per million (ppm) total suspended sediment (TSS) value was not used as a baseline value but rather as a threshhold value.

The impact of sediment on fisheries can best be measured by comparing the current or projected condition of a stream against a given threshold condition. This threshold represents a level of sediment production beyond which a certain level of fisheries cannot be maintained. Research has shown that when gravels contain over 20 percent by volume of fine particles, fish populations are significantly impacted. We have adopted a standard (Forest Plan, Forest-wide Standard Fisheries #6) designed to ensure that sediment production does not reach this level.

The Final EIS, in Chapter II, shows projected changes in fish numbers that are available (recruitable) to downstream fisheries for each alternative.

AAA. See response F. We have, in Chapter IV, improved the discussion of impacts associated with water yield.

BBB. The Geographical Display Areas have been corrected to acknowledge the westslope cutthroat and stream dwelling grayling where appropriate. The cutthroat and grayling have been included as indicator species in the Forest Plan. The Implementation Chapter indicates that monitoring will be undertaken to track and permit response to any declines in indicator species populations.

CCC. There is flexibility in the timber harvest program throughout the Forest in that the allowable sale quantity can be offered only if Forest Plan standards, including Management Area direction, can be met. Forest-wide standards for Fisheries and Watershed, and use of best management practices are designed to protect the resource values you are concerned about. Monitoring will validate the effectiveness of those standards and best management practices.

DDD a given stream on the BHNF to accurately describe factors limiting the population. Habitat improvement structures will do little to improve a fishery if another factor is limiting. Moreover, these structures are expensive, and their success in high gradient mountain streams is mostly untested. Preventing habitat loss is much more cost effective, and should be a higher priority than habitat improvement.

11. Wildlife.

The BHNF is nationally known for quality elk hunting. Benefits from increased road construction must be balanced against proposed decreases in elk hunting quality and potentially greater restrictions on hunting opportunities. While the DEIS projects a 10 percent decrease in elk security cover forestwide over the next 50 years, it must be recognized that the loss of security will be much greater in areas of concentrated timber harvest.

a. Standards.

EEE We concur with the Plan's standard to not harvest timber adjacent to previous clearcuts in management areas 11, 12, 13, 19,20, 21 and 26 until wildlife hiding cover has been established. This standard should be applied to all clearcut areas if the potential for adverse impacts to elk hunting quality in the BHNF is to be reduced. In addition, thinning prescriptions may effectively delay the period of time it takes a regenerated stand of timber to be established as "hiding" cover. This effect should be acknowledged in the Plan.

FFF We recommend that a standard be added to the Plan that limits the amount of timber removal immediately adjacent to "key" wildlife areas (such as wet meadows) to no more than one-third of the area. Subsequent re-entry logging in the adjacent areas should not occur until hiding cover is re-established in the original cut.

GGG Appendix D addresses the management recommendations from the 1982 progress report of the Montana Cooperative Elk Logging Study. Some of these recommendations (e.g., elk winter range) have been altered in the supplement. We support the use of these recommendations in the Plan, but request that the recent final report dated January, 1985 be cited verbatim.

b. Geographical Display Areas (GDAs)

The Plan proposes to change several geographic areas from "low intensity" timber harvest to "high intensity" timber harvest. Elk populations which use several of these areas have the potential to be adversely affected as a result of:

- A further reduction of an already limited amount of highly important security habitat if timber harvest occurs before adjacent areas can provide adequate replacement security habitat.

DDD. Prior to installing any fisheries habitat improvement structures, an analysis of habitat potential and needs will be conducted for a drainage or set of drainages and a Fisheries Habitat Improvement schedule developed. This is an effort to ensure that habitat improvement structures do, in fact, improve the fishery resource.

EEE. We have moved the standard regarding reestablishment of hiding cover from specific Management Areas and incorporated it as Forest-wide standards (Timber #11) that apply to key wildlife habitat components (moist areas, foraging areas, areas of high fall use by elk, thermal cover, migration routes and staging areas). Thus, the standard can more appropriately be appled to areas important for the maintenance of elk hunting quality whatever the Management Area designation.

The Forest Plan does not set time limits to the establishment of hiding cover. A thinned stand may take longer for reestablishment of hiding cover than an unthinned stand. In either instance, harvest of the adjacent stand in key habitat components can not occur until hiding cover is achieved, whatever the time frame.

FFF. Wildlife standard #9 has been adopted to address your concern.

GGG. The Montana Cooperative Elk Logging Study Final Report (January 1985) has been adopted as an Appendix to the Forest Plan and is discussed in Forest-wide standard Wildlife #6.

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- Timber harvesting activities in important migration corridors.
- Increased potential for additional herd movement onto adjacent private lands, further increasing landowner complaints.
- Possible additional hunting restrictions.

We recommend that the BHNF remain flexibile enough in its future timber harvest plans that the consideration and mitigation of these potentially significant wildlife impacts can be accomplished in the following areas of greatest concern:

HHH
- The small acreage of timber located on and along the northern portion of Buffalo Ridge (SE¼ SE¼ Sec. 33, R13W, T7S).
- Timber stands located below the logging road running north of Buffalo Creek.

III
- The area located between Vipond Park and Vipond Creek in the northeast corner of the East Pioneers (Sections 1, 2, 11 and 12 - T2S, R11W and Section 6, T2S, R10W).

JJJ
- Lands that are adjacent to winter ranges near Warm Springs Creek, in the Upper Ruby, and on Ruby Creek near the Wall Creek Game Range.

KKK
- GDAs 1A, 3A, 1C, 1D, and 1L.

We support the higher priority given wildlife in several GDAs in the Gravellys since the 1982 Plan. This significant and nationally recognized wildife area experiences some of the highest elk hunter pressure in Montana.

LLL It should be noted that sightings and evidence of grizzly bears in GDA 4B have been reported by BHNF personnel in recent years.

c. Appendix K.

MMM

Changes in management area designations since 1982 will benefit wildlife in the Lima and much of the Pioneers planning units. The same is not true of the west side of the Big Hole, particularly north of the Lost Trail-Wisdom highway, which is proposed to receive the emphasis of the timber harvest program in future years. This area (Hunting Districts 321 and 332) currently provides hunters greater opportunity to harvest branch antlered bull elk than can be found in most other areas of the state. Accelerated timber harvest planned for this sensitive area could greatly reduce elk security cover and future hunter opportunity.

We are concerned with the proposed transfer of parcel #19 into the timber base in the Gravelly Unit. This parcel includes several miles of slopes draining directly into the West Fork of the Madison River, one of the greatest contributors of sediment to the Madison River. Additional sedimentation associated with timber harvest could degrade this important fishery.

HHH. We have decided to remove the areas below the Buffalo Creek road from the suitable timber base because of of the high wildlife values in this ecotone area. The area above the road will remain within the timber base.

III. The island of timber in the middle of Vipond Park has been removed from the timber base because of its importance as elk security. The area west of Vipond Park, including an additional area south of Cannivan Gulch, remains in the land use designation that is suitable for timber management. Timber harvesting strategies and road management will minimize impacts to elk security in the area.

JJJ. These lands remain in the suitable timber base. Forest-wide standards regarding road management, hiding cover, and key habitat components are designed to ensure mitigation of wildlife impacts associated with timber management.

KKK. GDA IA is the Anaconda-Pintler Wilderness and is not available for timber management. We do not have any timber harvest plans for the area.

While portions of the other GDA's listed remain in the suitable timber base, Forest-wide standards are designed to ensure mitigation of wildlife impacts associated with the timber management program.

LLL. This has been noted in the description of the GDA.

MMM. Timber harvest will occur within the standards set by the Forest Plan designed to maintain elk security, water quality and fisheries habitat values. If these standards can not be met, the timber harvest program will be redesigned or rescheduled.

12. Fire.

NNN On p. III-25 of the EIS, mention should be made of the state's cooperative fire protection program, of which Beaverhead and Silver Bow counties are members.

On p. III-26 of the EIS, reference should be made to the State Airshed Group and the Cooperative Smoke Management Program.

13. Minerals

OOO Standard number 8 should include a statement indicating BHNF coordination and consultation with the Montana Department of Fish, Wildlife and Parks when assessing applications for seismic exploration.

NNN. We have adopted your suggestions.

OOO. We believe this concern is adequately addressed by Forest-wide standard Wildlife #1.

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State of Montana
Office of the Governor
Helena, Montana 59620

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TED SCHWINDEN
GOVERNOR

September 16, 1982

Joseph J. Wagenfehr
Forest Supervisor
Beaverhead National Forest
Box 1258
Dillon, Montana 59725

Dear Mr. Wagenfehr:

I want to thank you for the opportunity to review and comment on the Draft Beaverhead National Forest plan. The State of Montana's interagency planning task force has reviewed the plan and the following comments reflect its concerns and recommendations.

A It is clearly in the best interest of the Forest Service and the State of Montana to manage public lands and resources in a manner that promotes a variety of multiple use values without causing significant environmental damage. The social, economic and environmental fabrics of our communities must be maintained by carefully allocating scarce federal monies to programs that help guarantee that stability. No matter how elaborate a system of review, planning and implementation the Forest Service develops, the success of that system or forest plan depends largely on the quantity and particularly the quality of information used to make specific management allocation decisions. It is with this in mind that the State of Montana offers the following attached comments.

The primary concern is the effect the plan will have on the timber, recreation and livestock industries which are critically important to Montana and specifically to the local communities dependent upon Forest Service resources. I cannot overemphasize the importance of diversity in allocating and managing Forest Service resources. If multiple use and sustained yield concepts are to become realities, state and public input into those decisions must be a continuous process.

Of particular concern to Montana is the need to be assured that the Beaverhead Forest Plan does not upset or jeopardize the intricate and interdependent relationship between economic development and environmental protection. The Beaverhead Plan should maintain enough flexibility to provide opportunities and resources for the present and future needs of

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In the paragraphs below we have responded to concerns raised in your comments ton our 1982 Draft documents. Please note, we have only addressed your comments when they differ from those you made in 1985. The responses are as follows:

A. The Forest Plan is a multiple use plan that has taken all interests into consideration. The Plan considers the need to provide opportunities and resources for present and future local, regional and national needs. The results of the Plan will be monitored and revisions made every 10-15 years. Should the need arise, the Plan may be revised earlier than 10 years.

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Joseph J. Wagenfehr
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local communities. The attached comments, while more specific in nature, attempt to guarantee that existing and future opportunities continue to be available to the residents of Montana, particularly those dependent upon the Beaverhead National Forest.

Sincerely,

TED SCHWINDEN
Governor

cc: Forest Districts

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Additional Concerns:

B The State Interagency Planning Task Force found the DEIS and Land Management Plan difficult to follow. The tie between the computer generated outputs and the actual land base allocated to their production is not clear so it was virtually impossible to track the acreage allocations for various uses to specific sites on the ground.

C Map displays should be used to help comprehend the existing resource situation (inventory) on the Forest and the various management alternatives offered. A map supplement similar to the one provided with the 1978 Beaverhead Forest Plan would be helpful. A thorough understanding of the resource inventory and its location is necessary to understand the appropriateness and trade-offs inherent in the various alternatives. Forest-wide alternative maps would provide a better understanding of the various land allocations (i.e. commercial timberland, winter-summer game range, grazing leases, and designated recreational areas) and how these allocations interact with the resource base.

D The emphasis placed on displaying the results from running the FORPLAN program resulted in considerable use of very technical "jargon" with limited interpretation. The general impression given is one of a "black box" solution to a complex problem --beyond the comprehension of the average reader.

E The Resource Planning Act's (RPA) 1980 national goals were compiled from earlier non-integrated planning documents. Forest targets based on these goals probably do not accurately reflect land capabilities and resource trade-offs. Because of the Forest planning process, land capabilities and resource trade-offs are now more thoroughly understood. Each individual national forest, in formulating Forest plans, should have the flexibility to depart from previously assigned targets when target achievement would exceed land capabilities or create unacceptable resource conflicts.

Management direction provided by the proposed plan is general, lacks geographical specificity, and relies on forest-wide standards and guidelines. Consequently, the plan's usefulness as a future management tool is reduced.

The wildlife descriptions were not complete for several of the geographical display areas within the draft. Those specific items are attached as appendix A.

SPECIFIC CONCERNS

The following concerns were expressed in the Lolo Forest Plan but also apply to the Beaverhead Forest Plan:

1. The National "willingness to pay" value of $21 used to assess the economic value of hunting and fishing recreation is too low. The averaging of values between states and types of hunting downplays the importance of hunting and fishing recreation to a state like Montana where it is a favored recreation of many residents and draws considerable nonresident use.

B. The Revised Draft and Final Environmental Impact Statements (EIS's) and Final Forest Plan represent a significant improvement over the 1982 documents.

C. While we agree that alternative displays like those done in 1978 are an excellent graphic, costs to produce this type of display are prohibitive. The resource tradeoffs are discussed and alternatives compared in Chapter II of the Final EIS. The Alternative displays accompanying the EIS give a summary of Management Area assignments. Management Areas are discussed in detail in the Forest Plan.

D. The EIS is a "disclosure" document and, as such, documents the technical processes involved in planning. Interpretation of technical analysis is, at least to some extent, given to technical language. We have omitted the jargon and technical language in the documents to the extent possible.

E. Forest Plans, subsequent implementation of those Plans and monitoring of the results of implementation will provide information for determining future RPA goals. The Forest retains the flexibility to and does renegotiate assigned RPA targets when these targets exceed land capability, create unacceptable resource conflicts, or exceed the Forest's budgetary ability to produce the targets and protect other resources adequately.

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2. Although the plan calls for the closure of 75 percent of the local roads after commodity extraction -- where, when, and how is not clearly defined. We recommend the road management policy indicate that road closures will be used to maintain hunting opportunities and preserve viable habitat, as well as to distribute big game harvest and provide recreational hunting opportunities. An aggressive road management program is the best tool the forest service can use to utilize and control wildlife population.

3. The 99 percent increase in sediment production over baseline is extremely high. If the existing "Best Management Practices" cannot control or decrease sediment yield, then better practices should be developed or the land should not be used for that purpose.

   Sediment yield is very difficult to quantify. Most Forest Service water quality programs include sampling of Total Suspended Solids (TSS) and/or Turbidity. This type of information is valuable, but only quantifies a very small percentage of the total sediment load. Collection of sediment data should include turbidity, TSS, and a bedload/washload analysis at a minimum.

F

4. Hunting opportunity as it is affected by open roads and timber harvest should be a part of the analysis. The Beaverhead has published a supplement indicating the influence the alternatives will have on hunting opportunity. The final plan should incorporate this supplement.

5. The influence of the various alternatives on downstream fisheries should be included in the analysis. The importance of the "blue ribbon" trout streams (Madison and Bighole Rivers) to both nonresident and resident fishermen, as well as the local economies that depend on this resource should not be overlooked.

Statements were made that monitoring will take place where necessary as forest goals are met. Since it is our understanding that budgets for watershed and soils on most of the Region One forests are being reduced, can an expanded monitoring program be carried out on individual watersheds?

The following concerns are more specific to the Beaverhead Plan:

G

Utility and transportation corridor planning criteria are being developed by the joint Forest Services (FS), Bureau of Land Management (BLM), and State Corridor Planning Team and will be applied to the Final Beaverhead Forest Plan. The proposed plan should contain a Forest Guideline on corridors. In accordance with the Corridor Planning Committee Charter and Memorandum of Understanding for major facility siting between the Forest Service, Bureau of Land Management, and the State, a statement acknowledging that corridors and rights-of-way locations will be determined through joint intergovernmental review process (which complies with all applicable federal and state requirements) should be made a part of this document.

The process by which land allocations were determined are not fully understood. There is e.g., less acreage allocated to timber harvest under the proposed action than under current management. How was that conclusion reached?

F. Chapter II addresses elk hunting potential in the description of each alternative.

G. Forest-wide Goal #12 ensures coordination with the "land and resource planning efforts of other Federal, State, and local agencies, and with private landowners." In addition, Management Area 5 provides direction for cooridors and sites.

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The DEIS states that supply of recreation far exceeds demand on the Beaverhead. This assumption does not apply to some types of recreation such as hunting and fishing. The final plan should separate the various types of recreational use and more clearly define how they will affect the final allocations.

H Little mention was made of fire management policies in either the DEIS or the Plan. It would seem logical that fire control costs or effectiveness would have to change based on the various alternatives. If the same level of resource protection is to be maintained under all alternatives, then the costs of protection must change among the alternatives. Such factors as miles of road, acres harvested, activity fuels, and public access and use, all affect protection costs and all change substantially from one alterative to another.

I No mention is made of cooperative programs with other agencies. Discussions concerning air quality impacts from prescribed burning should reference the Montana Cooperative Smoke Management Plan and the activities of the State Airshed Group (of which the Forest Service is a member and cooperator). Fire control discussions should address intermingled land ownership and cooperation with other protection agencies; for example, Beaverhead County is now participating in the Montana County Cooperative Fire Protection Program and has a written fire plan for all private land adjacent to National forest lands.

J According to the Agricultural Handbook, No. 271 (USDA, Forest Service, 1965), the oldest lodgepole pine stand on record is located on the Beaverhead Forest. Does this stand still exist, and if so, what measures are proposed to protect it?

K Several timber sales are planned in the West Fork Madison drainage. Overgrazing in the early 1900's caused extensive damage to ground-cover, and large quantities of sediment were washed into the stream channels. The drainage has since begun to recover as better grazing practices were implemented. Timber harvest in this drainage will require better roads and more skid trails. Sediment production associated with roads and other timber harvest activities has been well documented. Future timber harvests in this drainage should be carefully controlled to the extent that degradation of recovering areas is minimal or non-existent?

The fisheries output summary and predicted numbers of trout on the forest for the alternatives is misleading. Both lake and stream fish are combined in the analysis, which masks the impact on stream fish. Habitat alterations primarily affect stream fish. Lake and stream fish habitat analysis should be dcne separately to analyze the impacts properly.

The significant differences in roading miles between alternatives would seem to result in much higher sediment yield differences than depicted. As an example, alternative two would have nearly twice the miles of roads as alternative three and yet only a 4 percent difference in sediment yields are predicted. Since forest-wide values would have a masking effect on sediment yields in individual drainages, we recommend that sediment production be evaluated for major drainages.

H. The Fire Management Plan, Appendix F to the Forest Plan, now references the Memorandum of Understanding with the Montana State Airshed Group. (See Appendix F.)

I. The Fire Management Action Plan, an unbound appendix to the Forest Plan, addresses intermingled ownerships the following ways: 1) Areas adjacent to private land fall into the control category. This means that all fires will be immediately attacked and controlled to minimize acreage burned; 2) the Forest operates under an interagency dispatch center that includes the BLM, Beaverhead National Forest and Deerlodge National Forest. Under this center all agencies fire fighting forces are available for use by another agency for fire control; 3) this interagency center dispatches firefighting forces under the closest crews concept. This means that the closest available fire control force will be used to attack and control any fires within any of the agencies protection responsibility.

J. The stand of timber is located in the West Pioneer Recreation Management Area. No timber harvest is scheduled in this MA.

K. Over the next ten years a much smaller proportion of the Forest's harvest will be from this area. Hiding cover for big game will be regained prior to future entries. Future harvests will be guided by Forest-wide and Management Area standards.

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"Local roads will be generally constructed by timber purchasers but there is a need in all alternatives to finance collectors roads with appropriated money." We are reluctant to support the construction of any roads for timber removal, collector or local, when the long-term timber value cannot carry the cost.

The 55 percent maximum level of utilization allowed by livestock on primary range should not be universally applied to all areas. Some areas of primary range are vital to wildlife as well as livestock at least during certain times of the year, while other areas not utilized by wildlife may be able to support more livestock use than the 55 percent maximum level.

We recommend that specific management guidelines be implemented for road management during the hunting season that will maintain big game habitat capability and hunting opportunity. Those items being considered as a road management policy by the Department of Fish, Wildlife and Parks should be considered in the development of those management guidelines. Their suggested management guidelines are as follows:

Existing Percent Hiding Cover	Open Road Density Range
80	0.0-2.4 mi/mi^2
70	0.0-1.9 mi/mi^2
60	0.0-1.2 mi/mi^2
50	0.0-0.1 mi/mi^2

The bulk of the monitoring appears to be after the fact; e.g., Riparian Zone monitoring generates a report every five years. Why is it necessary to wait five years to identify riparian degradation or enhancement? We suggest a more positive approach to the problem would be to identify existing problem areas in riparian areas and to modify management activities to improve them early in the process. The basic concept of established monitoring and evaluation practices to determine how well objectives have been met is a very desirable practice if the land management plan is to be successfully implemented.

Water and sediment yields will be monitored once annually according to the plan [(p. 169) Water yield and quality]. Specific standards and guides should be established and plan of action formalized prior to determining the problem with sediment exists.

SUMMARY

A number of small sawmills in the area depend primarily on the flow of timber from the Beaverhead Forest. The current state of the timber industry has already put these mills' future in jeopardy. The forest plan's projected timber harvest is an increase over the past due to more efficient utilization, not an increase in area or number of logs. Are the local timber mills able to handle and utilize the smaller diameter material as anticipated? We do not know whether they have converted their equipment or if they can

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afford to convert it to comply with the Forest Service's increased utilization philosophy.

L It appears that the Forest has locked itself into choosing between the seven displayed alternatives, with no flexibility to select a compromise alternative. The harvest levels in alternative #6, e.g., could be combined with the initial focus of areas highly susceptible to the Mountain Pine Beetle found in alternative seven.

The target figures for elk populations range from 18,000 (high) to 12,220 (low). These figures and the associated discussion tend to minimize the importance of big game winter range on the National Forest. Since winter range is limited on the National Forest, the forest objective should be to provide the maximum, rather than anticipating that problems will result on private lands before the winter range on the forest is stocked to capacity. The higher the quality of forage on the forest lands, the longer elk will be able to make use of it, which can tend to reduce potential impacts on the adjacent private lands.

The final concern is the impact on in-state and out-of-state tourism. The forest plan projects a loss of perhaps 6,000 elk hunter days per year. Using the Wyoming estimates of $53.00 per day expenditures, this could mean as much as $318,000.00 per year. Negative impact on the local tourism industry could also result from the loss of water quality in downstream blue ribbon trout streams. The tourism potential in the area could be foregone if we lose unique blue ribbon trout streams, which have already been identified as having water quality problems. The Big Hole River has the only remaining significant river population of grayling in the lower 48 states and is one of Montana's nationally recognized Blue Ribbon trout streams.

L. We have examined a full range of alternatives in the planning process. The evidence gathered through the Forest planning process and public involvement overwhelmingly indicates the resources on the Beaverhead National Forest perceived to be most significant are the nonmarket "amenity" resources, not those assigned market values in the Forest planning analysis. The Selected Alternative is responsive to this input.

LIST OF AGENCIES, ORGANIZATIONS, AND PERSONS TO WHOM COPIES OF THE STATEMENT ARE SENT

FEDERAL

FEDERAL ELECTED OFFICIALS

HONORABLE MAX BAUCUS
UNITED STATES SENATE
WASHINGTON, DC

HONORABLE RON MARLENEE
U.S. HOUSE OF REPRESENTATIVES
WASHINGTON, DC

HONORABLE JOHN MELCHER
UNITED STATES SENATE
WASHINGTON, DC

HONORABLE JAMES A. MCCLURE
UNITED STATES SENATE
WASHINGTON, DC

HONORABLE PAT WILLIAMS
U.S. HOUSE OF REPRESENTATIVES
WASHINGTON, DC

FEDERAL AGENCIES

OFFICE OF ARCHITECTURAL & ENVIRONMENTAL PRESERVATION
ADVISORY COUNCIL ON HISTORIC PRESERVATION
WASHINGTON, DC

DIRECTOR'S OFFICE
ANIMAL & PLANT INSPECTION SERVICE PPQ
HYATTSVILLE, MD

ASSISTANT SECRETARY FOR POLICY & INTERNAL AFFAIRS
WASHINGTON, DC

ASSISTANT SECRETARY OF POLICY EVALUATION & RESEARCH
WASHINGTON, DC

BONNEVILLE POWER ADMINISTRATION
PORTLAND, OR

HEAD ENVIRONMENTAL UNIT
DELAWARE RIVER BASINS COMMISSION
WEST TRENTON, NJ

ENVIRONMENTAL INFORMATION CENTER
HELENA, MT

EPA, REGION VIII
DENVER, CO

DIRECTOR (A-104)
ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, DC

FEDERAL AGENCIES

EPA-REGION 8, MONTANA OFFICE
HELENA, MT

OFFICE OF DEPUTY GENERAL COUNSEL
EQUAL EMPLOYMENT OPPORTUNITY COMMISSION
WASHINGTON, DC

NORTHWEST REGION
OFFICE OF THE REGIONAL DIRECTOR
FEDERAL AVIATION ADMINISTRATION
SEATTLE, WA

ADVISOR ON ENVIRONMENTAL QUALITY
FEDERAL ENERGY REGULATORY COMMISSION
WASHINGTON, DC

OFFICE OF ENVIRONMENT AND DESIGN
FEDERAL HIGHWAY ADMINISTRATION
DENVER, CO

ENVIRONMENTAL STAFF
GENERAL SERVICES ADMINISTRATION
WASHINGTON, DC

CHIEF, SECTION OF ENERGY & ENVIRONMENT
INTERSTATE COMMERCE COMMISSION
WASHINGTON, DC

MISSOURI RIVER BASINS COMMISSION
OMAHA, NB

DESIGN ARTS PROGRAM
NATIONAL ENDOWMENT FOR THE ARTS
WASHINGTON, DC

ASSISTANT ADMINISTRATOR
RURAL ELECTRIFICATION ADMINISTRATION
WASHINGTON, DC

OFFICE OF EQUAL OPPORTUNITY
U.S. DEPARTMENT OF AGRICULTURE
WASHINGTON, DC

USDA INTERMOUNTAIN FOREST & RANGE EXPERIMENT STATION
OGDEN, UTAH

CHIEF, FOREST SERVICE
FOREST SERVICE - USDA
WASHINGTON, DC

DIRECTOR, ENVIRONMENTAL COODINATION
USDA FOREST SERVICE
WASHINGTON, DC

LIST OF AGENCIES, ORGANIZATIONS, AND PERSONS TO WHOM COPIES OF THE STATEMENT ARE SENT

FEDERAL AGENCIES

REGIONAL FORESTER
USDA FOREST SERVICE
MISSOULA, MT

USDA FOREST SERVICE
MISSOULA, MT

USDA FOREST SERVICE
BUTTE, MT

DEERLODGE NATIONAL FOREST
JEFFERSON RANGER DISTRICT
WHITEHALL, MT

DEERLODGE NATIONAL FOREST
PHILIPSBURG RANGER DISTRICT
PHILIPSBURG, MT

USDA FOREST SERVICE
HAMILTON, MT

BITTERROOT NATIONAL FOREST
STEVENSVILLE RANGER DISTRICT
STEVENSVILLE, MT

BITTERROOT NATIONAL FOREST
SULA RANGER DISTRICT
SULA, MT

USDA FOREST SERVICE
SALMON, ID

SALMON NATIONAL FOREST
LEADORE RANGER DISTRICT
LEADORE, ID

SALMON NATIONAL FOREST
NORTH FORK RANGER DISTRICT
NORTH FORK, ID

USDA FOREST SERVICE
ST. ANTHONY, ID

TARGHEE NATIONAL FOREST
DUBOIS RANGER DISTRICT
DUBOIS, ID

TARGHEE NATIONAL FOREST
ISLAND PARK RANGER DISTRICT
ISLAND PARK, ID

USDA FOREST SERVICE
STANFORD, MT

USDA FOREST SERVICE
MADISON, WI

USDA FOREST SERVICE
JUNEAU, AK

USDA FOREST SERVICE
FREDONIA, AZ

USDA FOREST SERVICE
SEATTLE, WA

USDA FOREST SERVICE
SPRINGERVILLE, AZ

FIELD OFFICE
USDA SOIL CONSERVATION SERVICE
DILLON, MT

USDA SOIL CONSERVATION SERVICE
BOZEMAN, MT

SHERIDAN FIELD OFFICE
USDA SOIL CONSERVATION SERVICE
SHERIDAN, MT

SOIL CONSERVATION SERVICE
ENVIRONMENTAL COORDINATOR OF
ECOLOGICAL SCIENCES DIVISION
WASHINGTON, DC

USDA SOIL CONSERVATION SERVICE
BOISE, ID

DEPUTY ASSISTANT
SECRETARY OF DEFENSE
WASHINGTON, DC

CHAIRMAN, DEPARTMENT OF DEFENSE
EXPLOSIVES SAFETY BOARD
ALEXANDRIA, VA

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DEPARTMENT FOR ENVIRONMENT & SAFETY
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DEPARTMENT OF THE AIR FORCE
DALLAS, TX

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UNITED STATES DEPARTMENT OF ENERGY
WASHINGTON, DC

DEPARTMENTAL ENVIRONMENTAL OFFICE
U.S. DEPT OF HEALTH & HUMAN SERVICES
WASHINGTON, DC

REGIONAL ADMINISTRATOR VIII
U.S. DEPT HOUSING & URBAN DEVELOP
DENVER, CO

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BOISE, ID

USDI BUREAU OF LAND MANAGEMENT
DILLON, MT

USDI BUREAU OF LAND MANAGEMENT
BUTTE, MT

USDI BUREAU OF LAND MANAGEMENT
BILLINGS, MT

USDI BUREAU OF LAND MANAGEMENT
ELKO, NV

USDI BUREAU OF MINES
SPOKANE, WA

USDI BUREAU OF RECLAMATION
BILLINGS, MT

DIRECTOR
USDI ENVIRONMENTAL PROJECT REVIEW
WASHINGTON, DC

USDI ENVIRONMENTAL PROJECT REVIEW
DENVER, CO

USDI FISH & WILDLIFE SERVICE
REDROCK WILDLIFE REGUGE
LIMA, MT

USDI FISH & WILDLIFE SERVICE
BILLINGS, MT

USDI FISH & WILDLIFE SERVICE
HELENA, MT

FEDERAL AGENCIES

USDI GEOLOGICAL SURVEY
DENVER, CO

USDI GEOLOGICAL SURVEY
HELENA, MT

USDI GEOLOGICAL SURVEY
GOLDEN, CO

BIG HOLE NATIONAL BATTLEFIELD
USDI NATIONAL PARK SERVICE
WISDOM, MT

USDI NATIONAL PARK SERVICE
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DENVER, CO

USDI RANGE MANAGEMENT STAFF
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MONTANA STATE SENATE

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HONORABLE DAVE BROWN
MT STATE HOUSE OF REPRESENTATIVES

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MT STATE HOUSE OF REPRESENTATIVES

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MONTANA STATE SENATE

HONORABLE J.D. LYNCH
MONTANA STATE SENATE

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MT STATE HOUSE OF REPRESENTATIVES

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HONORABLE TED SCHWINDEN
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OFFICE OF THE GOVERNOR
HELENA, MT

HONORABLE LAWRENCE G. STIMATZ
MONTANA STATE SENATE

HONORABLE JOHN VINCENT
MT STATE HOUSE OF REPRESENTATIVES

HONORABLE NORM WALLIN
MT STATE HOUSE OF REPRESENTATIVES

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ARIZONA GAME & FISH DEPARTMENT
FLAGSTAFF, AZ

GOVERNOR'S PLANNING TASK FORCE
HELENA, MT

IDAHO DEPT. OF FISH AND GAME
BOISE, ID

MONTANA DEPARTMENT OF AGRICULTURE
HELENA, MT

STATE AGENCIES

MONTANA DEPARTMENT OF COMMERCE
HELENA, MT

MONTANA DEPARTMENT OF HIGHWAYS
HELENA, MT

MONTANA DEPARTMENT OF STATE LANDS
HELENA, MT

MONTANA PUBLIC LANDS COUNCIL
HELENA, MT

MONTANA STATE WATER QUALITY BUREAU
HELENA, MT

MT ASSOC. OF CONSERVATION DISTRICTS
HELENA, MT

MT DEPT. OF NATURAL RESOURCES & CONSERVATION
HELENA, MT

MT DEPT. OF FISH, WILDLIFE & PARKS
HELENA, MT

MT DEPT. OF FISH, WILDLIFE & PARKS
MISSOULA, MT

MT DEPT. OF FISH, WILDLIFE & PARKS
BOZEMAN, MT

MT DEPT. OF FISH, WILDLIFE & PARKS
DILLON, MT

MT DEPT OF FISH, WILDLIFE & PARKS
BUTTE, MT

MT DEPT OF HEALTH & ENVIRONMENTAL SCIENCES
HELENA, MT

URBAN REVITALIZATION AGENCY
BUTTE, MT

LOCAL AGENCIES/ELECTED OFFICIALS

BEAVERHEAD COUNTY COMMISSIONERS
DILLON, MT

BEAVERHEAD COUNTY PLANNING BOARD
DILLON, MT

SUPERINTENDENT OF SCHOOLS
BEAVERHEAD COUNTY
DILLON, MT

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CHIEF EXECUTIVE
CITY OF BUTTE
BUTTE, MT

CITY-COUNTY MANAGER
DEERLODGE COUNTY
ANACONDA, MT

GALLATIN COUNTY COMMISSIONERS
BOZEMAN, MT

MADISON COUNTY COMMISSIONERS
VIRGINIA CITY, MT

SILVERBOW COUNTY COMMISSIONERS
BUTTE, MT

SUPERINTENDENT OF SCHOOLS
DISTRICT NO. 291
SALMON, ID

LIBRARIES

BUTTE-SILVER BOW PUBLIC LIBRARY
BUTTE, MT

CARROLL COLLEGE LIBRARY
HELENA, MT

CLANCY MEMORIAL LIBRARY
ENNIS, MT

COLORADO STATE UNIVERSITY LIBRARY
FORT COLLINS, CO

DILLON PUBLIC LIBRARY
DILLON, MT

FORT LEWIS COLLEGE LIBRARY
DURANGO, CO

HEARST FREE LIBRARY
ANACONDA, MT

IDAHO STATE UNIVERSITY LIBRARY
POCATELLO, ID

MADISON VALLEY CONSOL SCHOOLS
ENNIS, MT

RENNE LIBRARY, DOCUMENT DEPARTMENT
MONTANA STATE UNIVERSITY
BOZEMAN, MT

LIBRARIES

SHERIDAN PUBLIC LIBRARY
SHERIDAN, MT

UNIVERSITY OF IDAHO LIBRARY
MOSCOW, ID

WESTERN MONTANA COLLEGE LIBRARY
DILLON, MT

ORGANIZATIONS

AMERICAN FISHERIES SOCIETY
MONTANA CHAPTER
MISSOULA, MT

AMERICAN FISHERIES SOCIETY
MONTANA CHAPTER
KALISPELL, MT

AMERICAN MOTORCYCLIST ASSOCIATION
WESTERVILLE, OH

AMERICAN WILDERNESS ALLIANCE
ENGLEWOOD, CO

ANACONDA SPORTSMEN'S CLUB
ANACONDA, MT

AUDUBON LAST CHANCE
HELENA, MT

AUDUBON SOCIETY-PINTLAR
DILLON, MT

BEAVERHEAD FOREST CONCERNED CITIZENS
BUTTE, MT

BIG HOLE RIVER WATERSHED COALITION
BUTTE, MT

BIG HOLE RIVER WATERSHED COALITION
POCATELLO, ID

BIG HOLE SNOWMOBILE CLUB
WISDOM, MT

BUFFALO ROAD MUZZLELOADERS
WISE RIVER, MT

CONTINENTAL DIVIDE TRAIL SOCIETY
BETHESDA, MD

DEFENDERS OF WILDLIFE
MISSOULA, MT

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ORGANIZATIONS

DEFENDERS OF WILDLIFE
MISSOULA, MT

FLATHEAD COALITION
NIARADA, MT

GREAT BEAR FOUNDATION
MISSOULA, MT

GREATER YELLOWSTONE COALITION
BOZEMAN, MT

IDAHO CONSERVATION LEAGUE
BOISE, ID

IDAHO ENVIRONMENTAL COUNCIL
BOISE, ID

JEFFERSON VALLEY SPORTSMEN'S CLUB
WHITEHALL, MT

MADISON GALLATIN ALLIANCE
BOZEMAN, MT

MISSION VALLEY BACKCOUNTRY HORSEMEN
RONAN, MT

MONTANA AUDUBON COUNCIL
CHARLO, MT

MONTANA BOWHUNTERS ASSOCIATION
LEWISTOWN, MT

MONTANA HISTORICAL SOCIETY
HELENA, MT

MONTANA SNOWMOBILE ASSOCIATION
BOZEMAN, MT

MONTANA WILDERNESS ASSOCIATION
HELENA, MT

MONTANA WILDERNESS ASSOCIATION
HAMILTON, MT

MONTANA WILDERNESS ASSOCIATION
KILA, MT

MONTANA WILDLANDS COALITION
HELENA, MT

MONTANA WILDLIFE FEDERATION
BOZEMAN, MT

ORGANIZATIONS

MONTANA WOMEN IN TIMBER
HAMILTON, MT

NATIONAL AUDUBON SOCIETY
BOULDER, CO

NATIONAL OFF-ROAD BICYCLE ASSOC.
SOLVANG, CA

NATIONAL WILDLIFE FEDERATION
MISSOULA, MT

THE NATURE CONSERVANCY
HELENA, MT

THE NATURE CONSERVANCY
FORT COLLINS, CO

ROCKY MOUNTAIN NATURAL HERITAGE PROGRAM
DENVER, CO

SIERRA CLUB
SAN FRANCISCO, CA

SIERRA CLUB
POCATELLO, ID

SIERRA CLUB LEGAL DEFENSE FUND
DENVER, CO

SIERRA CLUB-NO. PLAINS REGION
SHERIDAN, WY

SIERRA CLUB-NW OFFICE
SEATTLE, WA

SKYLINE SPORTSMEN'S ASSOCIATION
RAMSAY, MT

THE TRUMPETER SWAN SOCIETY
MAPLE PLAIN, MN

TROUT UNLIMITED
BOZEMAN, MT

TROUT UNLIMITED
MISSOULA, MT

TROUT UNLIMITED
BOZEMAN, MT

TROUT UNLIMITED-GEORGE GRANT CHAPTER
BUTTE, MT

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ORGANIZATIONS

TROUT UNLIMITED
VIENNA, VA

THE WILDERNESS INSTITUTE
UNIVERSITY OF MONTANA
MISSOULA, MT

THE WILDERNESS SOCIETY
WASHINGTON, DC

THE WILDERNESS SOCIETY
BOISE, ID

WILDLIFE MANAGEMENT INSTITUTE
WASHINGTON, DC

WILDLIFE MANAGEMENT INSTITUTE
PORTLAND, OR

WISE RIVER JACKPINE SAVAGES SNOWMOBILE CLUB
WISE RIVER, MT

BUSINESS/INDUSTRY

AMOCO MINERALS COMPANY
ENGLEWOOD, CO

AMOCO PRODUCTION CO
DENVER, CO

ARIZONA DAILY STAR
TUCSON, AZ

ARROW RANCH
WISDOM, MT

JACK ATCHESON & SONS, INC.
BUTTE, MT

ATKINS MINING & EXPLORATION INC.
DILLON, MT

ATLANTIC RICHFIELD CO
DENVER, CO

BEARTOOTH PLATEAU OUTFITTERS
ROBERTS, MT

BEAVERHEAD CHAMBER OF COMMERCE
DILLON, MT

THE BILLINGS GAZETTE
BOZEMAN, MT

BUSINESS/INDUSTRY

BOGUE, WEEKS & RUSCH
VERMILLION, SD

BUHLER LAND & CATTLE CO
LIMA, MT

LAND MANAGEMENT CORP OF N AMERICA
CANYON CREEK GUEST RANCH
LINCOLN, NB

CHAMBER OF COMMERCE
ENNIS, MT

CHAMPION INTERNATIONAL CORPORATION
MILLTOWN, MT

CHEVRON, USA INC
DENVER, CO

CONOCO INC
DENVER, CO

CORNUCOPIA DISTRIBUTION
SEATTLE, WA

CYPRUS MINES CORPORATION
ENGLEWOOD, CO

DARBY LUMBER, INC
DARBY, MT

THE COMPLETE FLY FISHER
WISE RIVER, MT

FLYING ARROW RANCH
BUTTE, MT

DELL BACON RANCH CO.
WISE RIVER, MT

ENVIRONMENTAL IMPACT SERVICES
TUCSON, AZ

EXXON COMPANY USA
DENVER, CO

F.H. STOLTZE LAND & LUMBER COMPANY
DILLON, MT

F.H. STOLTZE LAND & LUMBER COMPANY
COLUMBIA FALLS MT

FOREST PLANNING
EUGENE, OR

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BUSINESS/INDUSTRY

FREEPORT EXPLORATIONS
RENO, NV

GOETZ, MADDEN & DUNN, P.C.
BOZEMAN, MT

GOLD FIELDS MINING CORPORATION
LAKEWOOD, CO

GOLDSTONE MINING COMPANY
VALLEJO, CA

J DWIGHT HARRISON RANCH
DILLON, MT

HELMING & SONS, INC.
WISDOM, MT

HIGH COUNTRY NEWS
PAONIA, CO

JACK HIRSCHY LIVESTOCK, INC
JACKSON, MT

HOLLAND RANCH COMPANY
DILLON, MT

HOLLOW TOP RANCH
PONY, MT

HUSTED RANCHES, INCORPORATED
JACKSON, MT

IDAHO ENERGY RESOURCES CO.
BOISE, ID

IDAHO STUD MILL
ST. ANTHONY, ID

INLAND FOREST RESOURCE COUNCIL
MISSOULA, MT

INTER-FLUVE, INC.
BOZEMAN, MT

JACKSON RANCHES, INCORPORATED
JACKSON, MT

KNIGHT AND MACLAY
ATTORNEYS AT LAW
MISSOULA, MT

LAKEVIEW GUEST RANCH
LIMA, MT

BUSINESS/INDUSTRY

LAKEVIEW GUEST RANCH
BUTTE, MT

LOTT BROTHERS, INCORPORATED
TWIN BRIDGES, MT

LOUISIANA PACIFIC CORPORATION
SAND POINT, ID

LOUISIANA PACIFIC CORPORATION
DEERLODGE, MT

LOUISIANA PACIFIC CORPORATION
REXBURG, ID

MARATHON OIL COMPANY
CASPER, WY

THE MARBLE SHOP, INCORPORATED
IDAHO FALLS, ID

MERIDIAN LAND & MINERALS COMPANY
BILLINGS, MT

MINERALS EXPLORATION COALITION
DENVER, CO

THE MISSOULIAN
MISSOULA, MT

MONTANA ASSOCIATED UTILITIES
GREAT FALLS, MT

MONTANA PETROLEUM ASSOCIATION
HELENA, MT

MONTANA POWER COMPANY
BUTTE, MT

MOUNTAIN STATES LEGAL FOUNDATION
DENVER, CO

NEVILLE'S LOG HOMES
HAMILTON, MT

NEWLAND, HORN, CRIPPEN & PECK, PC
BUTTE, MT

NEWMONT EXPLORATION LTD.
HELENA, MT

NORTHERN ROCKIES RESOURCE CLINIC
MISSOULA, MT

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BUSINESS/INDUSTRY

NORTHWEST MINING ASSOCIATION
SPOKANE, WA

NORTHWEST POWER PLANNING COUNCIL
PORTLAND, OR

OUTDOORS UNLIMITED, INCORPORATED
DARBY, MT

PADDOCK LOGGING
WISDOM, MT

PFIZER, INCORPORATED
DILLON, MT

PINTLAR PACKERS
ANACONDA, MT

PLUM CREEK TIMBER COMPANY, INC
BOZEMAN, MT

PLUMCREEK TIMBER COMPANY, INC.
MISSOULA, MT

POWELL & ASSOCIATES
GRAND JUNCTION, CO

ROCKY MOUNTAIN OIL & GAS ASSOC.
DENVER, CO

SAGE ADVERTISING
HELENA, MT

SCHELLACK ENGINEERING & ASSOC.
DILLON, MT

SHELL WESTERN E & P INCORPORATED
HOUSTON, TX

SMITH, SMITH & TAYLOR
CLINTON, IL

SNOWLINE GRAZING ASSOCIATION
DILLON, MT

SOHIO PETROLEUM COMPANY
DENVER, CO

SOUTHWEST MT STOCKMEN'S ASSOC.
JACKSON, MT

STOCKTON OUTFITTERS
WISE RIVER, MT

BUSINESS/INDUSTRY

STOLTZE-CONNER LUMBER COMPANY
DARBY, MT

STRATA EXPLORATION ASSOC.
BUTTE, MT

SUNDANCE LODGE
WISE RIVER, MT

SUN EXPLORATION & PRODUCTION CO.
DENVER, CO

TENNECO MINERALS COMPANY
LAKEWOOD, CO

TEXACO INCORPORATED
DENVER, CO

THOMAS BROTHERS LOGGING
WISDOM, MT

TOBACCO ROOT RANCH CO.
SHERIDAN, MT

TRIBUNE CAPITAL BUREAU
HELENA, MT

TRUE OIL COMPANY
CASPER, WY

U.S. BORAX
SPOKANE, WA

VAL-DESTA MINES & MINERALS
BUTTE, MT

VIGILANTE ELECTRIC COOPERATIVE, INC
DILLON, MT

VIGILANTE ENTERPRISES
DILLON, MT

WALL CREEK OUTFITTERS
WHITEHALL, MT

WESTERN ENVIRONMENTAL TRADE ASSOC.
HELENA, MT

WESTERN FOREST INDUSTRIES ASSOC.
PORTLAND, OR

WILKE BROS. SAWMILL
WISDOM, MT

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DARRYL BAKER
SUSAN BALDWIN
DARCY BALLANTINE
DR. & MRS. ALAN BARBOUR
DALE BARGMANN
DIANE BECHARD
BARB BECK
LYNN & BOB BELL
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KEN BENDER
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SUE BENNETT
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TAMARA R. BLACK
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MAUREEN BOWMAN
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CATHERINE P. BROWMAN
PHILIP S. BROWN
TAMZIN BROWN
JAMES L. BROWNE
TERRI BROWNELL
SUSAN MILES BRYAN
DALE BRYANT
SHERRI BRYANT
BRIAN W. BUCK
TOM BUGNI
GARY A. BUJOK
KEN BUJOK
DALE BURK
PAT BURKE
CINDY BURKHARDT
KATHY BURKHART
GARY W. BURNETT
MARY ANN BURNS
ANDREW P. BUTLER
CHEYE ANN BUTLER
ROBERT G. BUTLER
WILLIAM D. CAIN
RICHARD CAIZZA
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REX CARAKER
HENRY CAREY
TRUDI CARLIN
GARRY J. CARLSON
TED R. CARLSON
TOM CARROLL
MEREDITH E. CASEY
XAVIER CEDANO
DANIEL CHAON
BRADLEY CHASE
PAUL & KATHY CHEESMAN
FLORENCE CHESSIN
MEYER CHESSIN, PH.D
BETH CHRISTENSEN
NORMAN M. CHRISTENSEN, M.D.
SHIRLEY A. CHRISTENSEN
LAWRENCE CHRISTIANSEN
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JENNIE CHRISTOPHER
KATIE CHRISTOPHER
ANN MARIE CHYTRA

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INDIVIDUALS

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CELIA COHEN
CONSTANCE M. COLE
DAVID COLE
MARY COLE
GLENN COMPTON
JAMES CONNER
ROBERT H. COOMBS
JERRY & YVONNE COOPMANS
SALENA COPPEY
JOE CORYELL
LARRY L. CORYELL
JIM COURTNEY
ROGER E. & MARJORIE COX
MICHAEL CRAIG
MALINEE CRAPSEY
JOHN CRAWFORD
TOM CRAWFORD
MARTRE CRONE
JEFFREY A. CROOK
BILL CUNNINGHAM
KARL CUPP
JAMES F. CURTIS
DAN CYPHER
JAMES R. D'ADDEZIO
GREG DANELZ
BARBARA DAVIS
CHARLES E. DAVIS, JR.
DOYLE M. DAVIS
ERIC DAVIS
NIGEL DAVIS
HELEN H. DAY
KAREN DE BRAAL
PHIL DEAN
WILLOW DEAN
DENNIS A. DELANO
HELEN S. DEMAREE
JEFF L. DEMPSEY
V. DERSAM
RANDY DICKEY
SHARON DICKINSON
LYNNE DICKMAN
STEPHEN DICOMITIS
DENNIS DIRCKY
TED DODGE
DENNIS DOHERTY
DANIEL M. DOLAN
MAC DONOFRIO
JIM DOOLITTLE

INDIVIDUALS

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MARGARITA DRITSHULAS
THELMA C. DU VINAGE
FRANK DUGAN
CARL DUNKERSON, JR.
J. A. DUSING, M.D.
PHIL S. DUVAL
LYNN D. ECK
DAVID A. EFKEN
TERRY EGENHOFF
HERSCHEL A. ELARTH
STEPHEN M. ELFELT
DR. K. A. ELLIOTT
LESTER J. ELSE
JAMES H. EMERSON
CELESTE G. ENGEL
KIRBY C. & PAMELA ERICKSON
RAY ERICKSON
CLYDE H. ERIKSEN
RICK ERMAN
JULIA ERVIN
LOREN ESKELSON
DON A. ESSIG
RON EWART
VIRGIL BENSON & DEAN FASNACHT
WILLIAM J. & MARGARET FAUST
TIM FAY
BILL FELLOWS
DON RED FERN
MARK T. FIEGE
G. V. FISCHER
MATT FISCHER
GARRY D. FLAVELL
EDWARD M. FOLEY
LOREEN FOLSOM
ART FORAN
SHARON FORD
THOMAS A. FORD
DICK FOREHAND
SUSAN FORMAN
DOUGLAS L. FORREST
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GLOSSARY

EQUIVALENT	A unit of habitat output related to land or water in habitat improvement projects. Acre equivalents are based on the number of acres of habitat that are influenced rather than the acres actually modified by the habitat improvement project. For example, an acre of winter range habitat improvement may be credited with influencing 4 acres of summer range.
FOOT	A measure of water or sediment volume equal to the amount that would cover an area of 1 acre to a depth of 1 foot (325,851 gallons or 43,560 cubic feet).
IVITY FUELS	Logging debris generated from any activity on the Forest such as firewood gathering, precommercial thinning, timber harvesting, and road construction, which increases the potential for wild fire.
STRATIVE	Those facilities, such as Ranger Stations, work centers and cabins, which are used by the Forest Service in the management of the National Forest.
SHEDS	Basic units in which air quality is managed.
WABLE SALE TITY (ASQ)	The quantity of timber that may be sold from the area of suitable land covered by the Forest Plan for a time period specified by the plan. This quantity is usually expressed on an annual basis as the "average annual allowable sale quantity."
NITY UE	Typically used in land-use planning to describe the resource properties for which market values (or proxy values) are not or cannot be established.
NALYSIS AREA	A grouping of homogeneous land areas, formed from the land and resource inventory data comprising the data base. Similarities are in terms of common capabilities to produce resources and susceptibility to impacts. Analysis areas need not be contiguous areas of land.
ANIMAL UNIT MONTH (AUM)	The quantity of forage required by one mature cow (1,000 lbs.) or the equivalent for one month.
PPROPRIATED FUNDING	Annual funding appropriated by Congress to the Forest Service disaggregated to units for use on various functional areas.
AUM	See animal unit month.

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GLOSSARY

A

ACRE-EQUIVALENT	A unit of habitat output related to fish or wildlife habitat improvement projects. Acre equivalents are based on the number of acres of habitat that are influenced by one habitat acre actually modified by the habitat improvement project. For example, an acre of winter range actually burned is credited with influencing 4 acres of summer range.
ACRE-FOOT	A measure of water or sediment volume equal to the amount which would cover an area of 1 acre to a depth of 1 foot (325,851 gallons or 43,560 cubic feet).
ACTIVITY FUELS	Logging debris generated from any activity on the Forest such as firewood gathering, precommercial thinning, timber harvesting, and road construction, which increases the potential for wild fire.
ADMINISTRATIVE SITE	Those facilities, such as Ranger Stations, work centers and cabins, which are used by the Forest Service in the management of the National Forest.
AIRSHED	Basic units in which air quality is managed.
ALLOWABLE SALE QUANTITY (ASQ)	The quantity of timber that may be sold from the area of suitable land covered by the Forest Plan for a time period specified by the plan. This quantity is usually expressed on an annual basis as the "average annual allowable sale quantity."
AMENITY VALUE	Typically used in land-use planning to describe the resource properties for which market values (or proxy values) are not or cannot be established.
ANALYSIS AREA	A grouping of homogeneous land areas, formed from the land and resource inventory data comprising the data base. Similarities are in terms of common capabilities to produce resources and susceptibility to impacts. Analysis areas need not be contiguous areas of land.
ANIMAL UNIT MONTH (AUM)	The quantity of forage required by one mature cow (1,000 lbs.) or the equivalent for one month.
APPROPRIATED FUNDING	Annual funding appropriated by Congress to the Forest Service disaggregated to units for use in various funtional areas.
AUM	See animal unit month.

B

BASELINE	With respect to soils, the amount of erosion and sedimentation due to natural sources in the absence of human activity.
BASE TIMBER HARVEST SCHEDULE (BASE SALE) SCHEDULE)	A timber sale schedule formulated on the basis that the quantity of timber planned for sale and harvest for any future decade is equal to or greater than the planned sale and harvest for the preceding decade and this planned sale and harvest is not greater than the long-term sustained yield capacity.
BENEFIT-COST RATIO	Measure of economic efficiency, computed by dividing total discounted primary benefits by total discounted economic costs.
BEST MANAGEMENT PRACTICES (Bmp's)	The set of standards in the Forest Plan which, when applied during implementation of a project, ensures that water related beneficial uses are protected and that State water quality standards are met. Bmp's can take several forms. Some are defined by State regulation or memoranda of undestanding between the Forest Service and the States. Others are defined by the Forest interdisciplinary planning team for application Forest-wide. Both of these kinds of bmp's are included in the Forest Plan as Forest-wide Standards. A third kind are identified by the interdisciplinary team for application to specific management areas; these are included as Management Area Standards in the appropriate management areas. A fourth kind, project level bmp's are based on site specific evaluation, and represent the most effective and practicable means of accomplishing the water quality and other goals of the specific area involved in the project. These project level bmp's can either supplement or replace the Forest Plan standards for specific projects.
BIOLOGICAL EVALUATION	An evaluation required by the Endangered Species Act of 1973 to identify any endangered species which is likely to be affected by a proposed management action.
BOARD FOOT	A unit of measurement represented by a board one foot square and one inch thick.
BROADCAST BURN	Allowing a controlled fire to burn over a designated area within well-defined boundaries, for reduction of fuel hazard, as a silvicultural treatment, or both.
BOARD FOOT/ CUBIC FOOT CONVERSION	Both board foot and cubic foot volumes can be determined for timber stands. The number of board feet per cubic foot of volume varies with tree species, diameter, and height, and form factors. For the Beaverhead National Forest, the ratio ranges from 2.8 - 3.4 board feet per cubic foot.

C

CAPABILITY AREA	A geographic delineation used to describe characteristics of the land and resources in integrated Forest planning. Capability areas may be synonomous with ecological land units, ecosystems or land response units.
CAPITAL INVESTMENT	Investment in facilities such as roads and structures with specially-appropriated funds.
CEQ	Council of Environmental Quality.
CFR	Code of Federal Regulations.
CLEARCUTTING	Harvesting of all trees in one cut. It prepares the area for a new, even-aged stand. The area harvested may be a patch, stand, or strip large enough to be mapped or recorded as separate age class in planning. Regeneration is obtained through natural seeding, or through planting or direct seeding.
CMAI	See Culmination of Mean Annual Increment.
COLLECTOR ROADS	Roads constructed to serve two or more elements but which do not fit into the other two road categories (arterial or local). Construction costs of these facilities are prorated to the respective element served. These roads serve smaller land areas and are usually connected to a Forest arterial or public highway. They collect traffic from local Forest roads or terminal facilities. The location and standard are influenced by both long term multi-resource service needs and travel efficiency. Forest collector roads are operated for constant or intermittent service, depending on land use and resource management objectives for the area served by the facility.
CONDITION CLASS	Description of the existing tree vegetation as it relates to size, stocking density, and age.
CONFINE	A fire suppression strategy which requires that the fire be restricted within determined boundaries established either prior to the fire, during the fire, or in an escaped fire situation analysis.
CONSTRAINT	A confinement or restriction on the range of permissible choices.
CONTAIN	A fire suppression strategy which requires that the fire and any spot fires therefrom be surrounded with a control line as needed, which can reasonable be expected to check the fire's spread under prevailing and predicted conditions.

CONTROL	To complete the control line around a fire, any spot fires therefrom, and any interior islands to be saved; burn out any unburned area adjacent to the fire side of the control line; and cool down all hot spots that can reasonable be expected to hold under foreseeable conditions.
CORRIDOR	A linear strip of land which has ecological, technical, economic, social, or similar advantages over other areas for the present or future location of transportation or utility routes.
CRITICAL HABITAT	Key land areas used by wildlife for forage and reproduction, including wallows, licks, meadows, parks, critical hiding cover, thermal cover, migration routes and staging areas.
CRITICAL HIDING COVER	Hiding cover which is located in areas of high elk use in the fall. These areas are identified by the concentration of animals, numerous pellet groups, or other signs of heavy use. If the cover associated with these critical security areas is significantly altered, it may result in a reduction of elk use over a larger habitat area and may adversely affect herd productivity.
CUBIC FOOT	The amount of timber equivalent to a piece of wood 1 foot by 1 foot by 1 foot.
CUBIC YARD	A measure of soil or sediment volume which would cover a square yard of area, one yard deep.(3 feet x 3 feet x 3 feet)
CULMINATION OF ANNUAL INCREMENT (CMAI)	The age of a stand at which the current annual volume growMEAN volume growth is equal to the average annual cubic foot volume growth. This is generally considered the optimal harvest age for maximum timber production over time.
CULTURAL RESOURCES	The physical remains of human activity (artifacts, ruins, burial mounts, petroglyphs, etc.) and conceptual content or context (as a setting for legendary, historic, or prehistoric events as a sacred area of native peoples, etc.) of an area.
CUMULATIVE EFFECTS FEASIBILITY ANALYSIS	An analysis conducted prior to management activities when those activities have the potential to affect soil and water resources. The analysis predicts the potential for sedimentation of the stream channel, changes in the amount and timing of water runnoff, and the potential effect on other resources such as fisheries resulting from the managment activities. The analysis is completed for on-forest activities only, and based solely on those activities which have predictable and measurable effects.

D

DEFERRED GRAZING SYSTEM	A grazing system where all pastures within an allotment are utilized during a given year but some are deferred during all or part of a season to allow for nutrient storage or seed production.
DEPARTURE	A schedule which deviates from the principal of nindeclining flow by exhibiting a planned decrease in the timber sale and harvest schedule in future decades.
DEVELOPED RECREATION	Recreation that occurs where improvements enhance recreation opportunities and accommodate intensive recreation activities in a defined area.
DIAMETER BREAST HEIGHT (DBH)	The diameter of a tree measured 4 1/2 feet above the ground.
DISCOUNTING:	An economic adjustment for the time value of money; mathematical reduction of costs and/or benefits which occur in the future to the present time for purposes of comparison.
DISPERSED RECREATION	That portion of outdoor recreation use which occurs outside of developed sites in the unroaded and roaded Forest environment i.e., hunting, backpacking and berry picking.
DIVERSITY	The distribution and abundance of different plant and animal communities and species within the area covered by a land and resource management plan.

E

ECOSYSTEM	A complete, interacting system of organisms considered together with their environment (for example; a marsh, a watershed, or a lake.)
ELK HIDING COVER	Vegetation, primarily trees, capable of hiding 90 percent of an elk seen from a distance of 200 feet or less.
ELK SECURITY COVER (EFFECTIVE ELK SECURITY COVER)	Elk hiding cover modified by open roads. The greater the density of open roads within an area, the less effective The figure is calculated by determining the needs of the elk, the amount of available cover, and the effect of open roads on the effectiveness of that cover.
ENDANGERED SPECIES	Plant or animal species identified by the secretary of Interior as endangered in accordance with the 1973 Endangered Species act.
EPHEMERAL STREAMS	Streams that flow only as a direct response to rainfall or snowmelt events. They have no baseflow.

EVEN-AGED MANAGEMENT	The application of a combination of actions that result in the creation of stands in which trees of essentially the same age grow together. Managed even-aged Forests are characterized by a distribution of the stands of varying ages (and, therefore, tree sizes) throughout the Forest area. The difference in ages between trees forming the main canopy level of the stand does not usually exceed 20 percent of the age of the stand at harvest rotation age. Regeneration in a particular stand is obtained during a short period at or near the time that a stand has reached the desired age or size for regeneration and is harvested. Cutting methods include: Clearcutting: The removal, in a single cut, of all trees in stands larger than seedlings. Shelterwood Cutting: The removal of all trees in a series of two or more cuts over a period of not more than 20 years. Seed Tree Cutting: Similar to clearcutting, except that a few of the better trees of the desired species are left scattered over the area to provide seed for regeneration. Residual seed trees may be removed from the site after regeneration has been established.

F

FORAGE	All browse and nonwoody plants available to livestock or wildlife for feed.
FORPLAN	A linear programming system used for developing and analyzing Forest planning alternatives.
FOREST SYSTEM ROADS	Roads that are part of the Forest development transportation system, which includes all existing and planned roads, as well as other special and terminal facilities designated as Forest development transportation facilities.
FSH	Forest Service Handbook
FSM	Forest Service Manual
FUELS	Include both living plants and dead, woody vegetation that are capable of burning.

G

GROUP SELECTION HARVEST	A modification of the selection system in which trees are removed from a stand over a period of time. Group selection harvest units generally do not exceed five acres in size.

H

HABITAT TYPE	An aggregation of all land areas potentially capable of producing similar plant communities at climax.
HIDING COVER	Trees of sufficient size and density to conceal animals from view at 300 feet.
HYDROLOGIC RECOVERY	The process of revegetation of a disturbed area which returns the site to pre-disturbance levels of water runnoff and timing of flow.

I

INDICATOR SPECIES	Species identified in a planning process that are used to monitor the effects of planned management activities on viable populations of wildlife and fish including those that are socially or economically important.
INVENTORIED ROADLESS AREAS	Those lands identified as roadless in the RARE II evaluation updated for the effects of recent management if any.

K

KEY WILDLIFE HABITAT COMPONENTS	Areas or features of the forest which are of particular importance for maintaining overall wildlife habitat. These areas and features include; moist areas, wallows, meadows, parks, critical hiding cover, thermal cover, migration routes and staging areas.
KV FUNDING	Monies collected as a percentage of timber sale reciepts in accordance with the Knutson/Vandenberg Act of 1930 to be used on timber sale areas for cultural and betterment practices such as planting, thinning and wildlife habitat management.

L

LANDTYPE	An area of land classified on the basis of geomorphic attributes. An understanding of geologic processes (as reflected in land surface form and features), individual kinds of soil, and the factors which determine the behavior of ecosystems (i.e., climate, vegetation, relief, parent materials, and time) is used as the basis of this classification system.
LOCAL ROADS	Roads constructed and maintained for, and frequented by, the activities of a given resource element. Some use may be made by other element activities, but normally maintenance is not affected by such use. These roads connect terminal facilities with Forest collector or Forest arterial roads or public highways. The location and standard, usually are determined by

the requirement of a specific resource activity rather than by travel efficiency. Forest local roads may be developed and operated for constant or intermittent service, depending on land use and resource management objectives for the area served by the facility.

LONG-TERM SUSTAINED YIELD (LTSY)	The highest uniform wood yield from lands being managed for timber production that may be achieved and sustained under a specified intensity of management, consistent with multiple use objectives.

M

M	Thousand
MM	Million
MAUM	Thousand Animal Unit Months.
MBF	Thousand Board Feet
MMBF	Million Board feet
MMCF	Million Cubic feet
MANAGEMENT AREA	An aggregation of capability areas which have common management direction and may be noncontiguous in the Forest. Consists of a grouping of capability areas selected through evaluation procedures and used to locate decisions and resolve issues and concerns.
MANAGEMENT CONCERN	An issue, problem, or a condition which constrains the range of management practices identified by the Forest Service in the planning process.
MANAGEMENT EMPHASIS	A management practice or combination of management practices designed to stress production of a particular type of output or mix of outputs.
MANAGEMENT INTENSITY	A management practice or combination of management practices and associated costs designed to obtain different levels of goods and services.
MANAGEMENT PRESCRIPTION	Management practices and intensities selected and scheduled for application on a specific area to attain multiple use and other goals and objectives.
MARKET VALUE	The unit price of an output normally exchanged in a market after at least one stage of production, expressed in terms of what people are willing to pay as evidenced by market transactions.

MATURE TIMBER	Stands of trees which have achieved or exceeded culmination of mean annual increment.
MEAN ANNUAL INCREMENT	The total increase in girth, diameter, basal area, height, or volume of individual trees or a stand up to a given age divided by that age.
MINERAL ENTRY	The filing of a mining claim for public land to obtain the right to any minerals it may contain.
MINERAL WITHDRAWAL	The exclusion of the right of possession of locatable mineral deposits by the locator on areas required for administrative sites by the Forest Service and other areas highly valued by the public.
MINERAL EXPLORATION	The search for valuable minerals on lands open to mineral entry.
MINERAL PRODUCTION	Extraction of mineral deposits.
MINERALS, COMMON	Common rock, gravel, and sand deposits used generally for road construction and maintenance.
MINERALS, LEASABLE	Coal, oil, gas, phosphate, sodium, potassium, oil shale, sulpher (in Louisiana and New Mexico), and geothermal steam.
MINERALS, LOCATABLE	Those hardrock minerals which are mined and processed for the recovery of the minerals, often metallic. May include certain nonmetallic minerals and uncommon varieties of mineral materials such as valuable and distinctive deposits of limestone and silica. May include any solid, natural inorganic substance occurring in the crust of the earth, except for the common varieties of mineral materials and leasable minerals.
MINIMUM MANAGEMENT REQUIREMENTS	Standards for resource protection, vegetative manipulation, silviculturist practices, even-aged management, riparian areas, soil and water and diversity, to be met in accomplishing National Forest System goals and objectives (see 36 CFR 219.27).
MITIGATION	Avoiding or minimizing impacts by limiting the degree or magnitude of the action and its implementation; rectifying the impact by repairing, rehabilitating, or restoring the affected environment; reducing or eliminating the impact by preservation and maintenance operations during the life of the action.
MODIFICATION (VQO)	See Visual Quality, Objective (VQO)
MONTANA WILDERNESS STUDY ACT AREAS	Those areas that are required to be studied for their wilderness suitability under the Montana Wilderness Study Act of 1978 (Public Law 95-1950).

MULTIPLE USE	The management of all the various renewable surface resources of the National Forest System so that they are utilized in the combination that will best meet the needs of the American people; making the most judicious use of the land for some or all of these resources or related services over areas large enough to provide sufficient latitude for periodic adjustments in use to conform to changing needs and conditions; that some lands will be used for less than all of the resources; and harmonious and coordinated management of the various resources, each with the other, without impairment of the productivity of the land, with consideration being given to the relative values of the various resources, and not necessarily the combination of uses that will give the greatest dollar return or the greatest unit output.

N

NATIONAL ENVIRONMENTAL POLICY ACT (NEPA)	An act which encourages productive and enjoyable harmony between man and his environment; promotes efforts to prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of man; enriches the understanding of the ecological systems and natural resources important to the Nation; and establishes a Council on Environmental Quality.
NATIONAL FOREST LANDSCAPE MANAGEMENT SYSTEM	The planning and design of the visual aspects of multiple use land management to maintain or upgrade the visual quality of the landscape.
NATIONAL FOREST MANAGEMENT ACT (NFMA)	A law passed in 1976 as amendments to the Forest and Rangeland Renewable Resources Planning Act that requires the preparation of Regional and Forest plans and the preparation of regulations to guide that development.
NATIONAL RECREATION TRAILS	Trails designated by the Secretary of the Interior or the Secretary of Agriculture as part of the national system of trails authorized by the National Trails System Act. National recreation trails provide a variety of outdoor recreation uses in or reasonably accessible to urban areas.
NATIONAL REGISTER OF HISTORIC PLACES	A listing maintained by the National Park Service of areas which have been designated as being of historical significance. The Register includes places of local and State significance as well as those of value to the Nation as a whole.
NDSY	See nondeclining sustained yield.
NEPA	See National Environmental Policy Act.
NFMA	See National Forest Management Act.

NET PUBLIC BENEFITS	An expression used to signify the overall long-term value to the Nation of all outputs and positive effects (benefits) less all associated inputs and negative effects (costs) whether they can be quantitatively valued or not. Net public benefits are measured by both quantitative and qualitative criteria rather than a single measure or index. The maximization of net public benefits to be derived from management of units of the National Forest System is consistent with the principles of multiple use and sustained yield.
NONCONSUMPTIVE USE	Those uses of resources that do not reduce the supply. For example: Nonconsumptive uses of water include hydroelectric power generation, boating, swimming, etc.
NONDECLINING EVEN FLOW	The quantity of timber which can be sold from each National Forest equal to or less than a quantity which can be removed from such Forest annually in perpetuity on a sustained yield basis, greater than or equal to the volume offered for sale in the preceding decade. Nondeclining even flow is calculated and scheduled in the FORPLAN model on the basis of cubic foot volume.
NONGAME	Species of animals which are not managed as a sport hunting resource.
NONSTOCKED	Deforested land where woody vegetation is less than 15 feet tall and produces less than 40 percent crown cover as determined by aerial photogrammetry.
NOTICE OF INTENT	A document filed with the appropriate District Ranger by any person proposing to conduct mining operations which might cause disturbance of surface resources.

O

OBJECTIVE	A specified statement of measurable results to be achieved within a stated time preiod. Objectives reflect alternative mixes of all outputs or achievements which can be attained at a given budget level. Objectives may be expressed as a range of outputs.
OBJECTIVE FUNCTION	A term used in linear programming describing the criteria to be optimized. Examples of objective functions are: maximize present net value, minimize cost or maximize timber.
OCCUPIED HABITAT	Refers to those areas officially designated as providing current habitat for threatened or endangered species.
OFF-ROAD VEHICLE	Any vehicle capable of being operated off an established road or trail, e.g., motorbikes, four-wheel drives, and snowmobiles.

OLD GROWTH TIMBER	A stand of trees that is past full maturity and showing decadence; the last stage in Forest succession.
OPPORTUNITY COST	An opportunity cost is value foregone. In this analysis it is a cost calculated as the difference between present net value of the alternative and the present net value of the maximum PNV increment. Opportunity costs may be only a partial measure of foregone PNV or present net benefits.
OVERMATURE TIMBER	Trees that have attained full development, particularly in height, and are declining in vigor, health, and soundness.
OVERSTORY	The tallest component of a forest stand which usually dominates the competition for sunlight and available nutrients.
OVERTHRUST BELT	A narrow zone, extending from Alaska to Mexico, which resulted from compressional stresses within the earth, and which is characterized by abundant large thrust faults. This zone passes through and includes all of western Montana.

P

PARTIAL RETENTION (VQO)	See Visual Quality Objective (VQO)
PATENTED MINING CLAIMS	A patent is a document which conveys title to land. When patented, a mining claim becomes private property and is land over which the United States has no property rights, except as may be reserved in the patent. After a mining claim is patented, the owner does not have to comply with requirements of the General Mining Law or implementing regulations.
PERENNIEL STREAMS	Streams that flow continuously throughout most years.
PERMITTED GRAZING	Use of a National Forest range allotment under the terms of a grazing permit.
PERSON YEAR (WORK YEAR)	A person year equals 2,087 hours of work time. A person year may be one person working yearlong or several persons filling seasonal positions.
PLANNING AREA	The area of the National Forest System covered by a Regional or Forest Plan.

PLANNING HORIZON	The overall time period considered in the planning process that spans all activities covered in the analysis or plan and all future conditions and effects of proposed actions which would influence the planning decisions. In the National Forest planning process, this is 150 years.
PLANNING PERIOD	A time interval for which inputs and outputs are identified in a planning process. Current RPA and National Forest Plan intervals are 5 and 10 years, respectively.
PLANNING RECORDS	Documents and files that contain detailed information and decisions made in developing the Forest Plan. Available at the Forest Supervisor's Office.
PLAN OF OPERATION	A written plan describing mining and mineral processing activities that will likely cause a significant disturbance of surface requirements. Approved by a Forest officer, the plan is prepared by those engaged in Forest mining activities, such as prospecting or exploration.
POLETIMBER TREES	Live trees of commercial species at least five inches in diameter at breast height but smaller than sawtimber size, and of good form and vigor.
POTENTIALLY (TENTATIVELY) SUITABLE LAND	Forest land (as defined in CFR 219.3) for which technology is available that ensures timber production without irreversible resource damage to soils, productivity, or watershed conditions; for which there is reasonable assurance that such lands can be restocked (CFR 219.14); and which is available for timber management.
PRECOMMERCIAL THINNING	The selective felling, deadening, or removal of trees in a young stand primarily to accelerate diameter increment on the remaining stems, maintain a specific stocking, stand density or species composition, and improve the vigor and quality of the trees that remain.
PRESCRIBED BURNING	The intentional application of fire to wildland fuels in either their natural or modified state under such conditions as allow the fire to be confined to a predetermined area and at the same time to produce the intensity of heat and rate of spread required to further certain planned objectives (i.e., silviculture, wildlife management, etc.)
PRESCRIBED FIRE	A fire burning under specified conditions which will accomplish planned objectives in strict compliance with an approved plan and the conditions under which the burning takes place and the expected results are specific, predictable, and measurable.
PRESCRIPTION	See Management Prescription.

PRESENT NET VALUE (PNV)	The difference between the discounted value (benefits) of all outputs to which monetary value or established market prices are assigned and the total discounted costs ofmanaging the planning area.
PRESERVATION (VQO)	See Visual Quality Objectives (VQO)
PRIMITIVE RECREATION SETTING	A classification of the recreation opportunity spectrum that characterizes an essentially unmodified natural of a size or remoteness that provide significant opportunity for isolation from the signs and sounds of man and a feeling of vastness of scale. Visitors have opportunity to be part of the natural environment, encounter a high degree of challenge and use a maximum of outdoor skills but have minimum opportunity for social interaction.
PRODUCTIVITY	See Site Productivity.
PUBLIC ACCESS	Usually refers to a road or trail route over which a public agency claims a right-of-way available for public use.
PUBLIC INVOLVEMENT	A Forest Service process designed to broaden the information based upon which agency decisions are made by (1) Informing the public about Forest Service activities, plans, and decisions, and (2)Encouraging public understanding about and participation in the planning processes which lead to final decision making.
PUBLIC ISSUE	A subject or question of widespread public interest identified through public participation relating to management of National Forest System lands.

R

RANGE ALLOTMENT	A designated area of land available for livestock grazing upon which a specified number and kind of livestock may be grazed under a range allotment management plan. It is the basic land unit used to facilitate management of the range resource on National Forest System and associated lands administered by the Forest Service.
RANGE, TRANSITORY	See Transitory range.
RANGELAND	Land on which the climax vegetation (potential natural plant community) is predominantly grasses, grasslike plants, forbs, or shrubs suitable for grazing and browsing. It includes natural grasslands, savannas, many wetlands, some deserts, tundra and certain forb and shrub communities. It also includes areas seeded to native or adapted introduced species that are managed like native vegetation.

RARE II	See Roadless Area Review and Evaluation II.
RECEIPTS	Money collected from timber stumpage, livestock grazing, campgrounds, special use permits, and returned to the federal government.
RECORD OF DECISION	A document separate from but associated with an environmental impact statement that publicly and officially discloses the responsible official's decision on the proposed action.
RECREATION INFORMATION MANAGEMENT (RIM)	The Forest Service system for recording recreation facility condition and use.
RECREATION MANAGEMENT AREA	An area of several thousand acres in which the management emphasis is on recreation and in which direction is given to establish a Recreation Area Management Plan.
RECREATION OPPORTUNITY SPECTRUM (ROS)	A system for planning and managing recreation resources that recognizes recreation activity opportunity, recreation setting opportunity, and recreation experience opportunity along a spectrum or continuum.
ROS CLASSES	Primitive (PRIM) Area is characterized by essentially unmodified natural environment of fairly large size. Interaction between users is very low and evidence of other area users is minimal. The area is managed to be essentially free from evidence of man-induced restrictions and controls. Motorized use within the area is not permitted. Semi-Primitive Non-Motorized (SPNM) Area is characterized by a predominantly natural or natural-appearing environment of moderate-to-large size. Interaction between users is low, but there is often evidence of other users. The area is managed in such a way that minimum on-site controls and restrictions may be present, but are subtle. Motorized use is not permitted. Semi-Primitive Motorized (SPM) Area is characterized by a predominantly natural or natural-appearing environment of moderate-to-large size. Concentration of users is low, but there is often evidence of other area users. The area is managed in such a way that minimum on-site controls and restrictions may be present, but are subtle. Motorized use is permitted. Roaded Natural Appearing (RNA) Area is characterized by predominantly natual appearing environment with moderate evidences of the sights and sounds of man. Such evidences usually harmonize with the natural environment. Interaction between users may be low to moderate, but with evidence of other users prevalent. Resource modification and utilization practices are evident, but harmonize with the natural

environment. Conventional motorized use is provided for in the construction standards and design of facilities.

Roaded Modified (RM) Area is characterized by substantially modifed natural environment where evidence of man's activities are readily apparent. Such activities are usually resource-based (as opposed to "Rural", where man's activities may not necessarily be directly resource-related). Typical activities include timber harvest, mineral extraction, and livestock grazing. Such evidences may or may not harmonize with the natural environment. Interaction between users may be low to moderate, but evidence of other users prevails. Resource modification and utilization practices are readily evident and may dominate. Conventional motorized use is provided for in the construction standards and design of facilities.

Rural (R) Area is characterized by substantially modified natural environment. Resource modification and utilization practices are primarily to enhance specific recreation activities and to maintain vegetative cover and soil. Sights and sounds of man are readily evident, and the interaction between users is often moderate to high. A considerable number of facilities are designed for use by a large number of people. Facilities are often provided for special activities. Moderate densities are provided far away from developed sites. Facilities for intensified motorized use and parking are available.

RECREATION TYPES

A term used in this EIS to indicate the type of recreation experience sought by Forest users. They are overlapping portions of the total recreation preferences spectrum that the public may express demands for.

Type I - Orientations toward using the natural, unmodified environment for the appreciation and understanding of natural phenomena; as a source of intelletual and/or physical challenges; for seeking solitude; and for esthetic stimulations.

Type II - Orientations toward using a natural or semiprivate environment in searching for and extraction of indigenous fish and/or game species, rocks, minerals, edible plants, etc., and for enjoyment of the physical surroundings in which such extractable objects are found.

Type III - Orientations toward using semipimitive, lightly developed areas for relaxing in natural surroundings; as a source of tranquility and freedom from tension; and for esthetic stimulation.

Type IV - Orientations toward using moderately developed areas and the surrounding environment for intentional social interaction and group learning experiences.abilities.

	Type V - Orientations toward using highly developed areas for social interactions with many other people and for pursuits which allow for the expression of learned physical abilities.
RECREATION VISITOR DAY (RVD)	One visitor day equals 12 hours (one person for 12 hours, or 12 people for 1 hour, or any combination thereof).
REDUCED SERVICE MANAGEMENT	Management of developed recreation facilities below established maintenance standards.
REFORESTATION	The renewal of forest cover by seeding, planting, and natural means.
REGENERATION	The renewal of a tree crop, whether by natural or artificial means.
REGIONAL GUIDE	A document developed to meet the requirements of the Forest and Rangeland Renewable Resources Planning Act of 1974, as amended, that guides all natural resource management activities and established management standards and guidelines for National Forest System lands of a given Region to the Forests within a given Region. It also disaggregates the RPA objectives assigned to the Region to the Forests within that Region.
REGULATED	The commercial forest land that is organized for timber production under the principle of sustained yield. The harvest of timber from this land is regulated to achieve multiple long range objectives, such as maintaining setting for recreational activities, rotating forage production areas and wildlife habitat, increasing water production yield, and increasing the growth and utilization of timber for the Nation's supply.
RESEARCH NATURAL AREA	An area in as near a natural condition as possible, which exemplifies typical or unique vegetation and associated biotic, soil, geologic, and acquatic features. The area is set aside to preserve a representative sample of an ecological community primarily for scientific and educational purposes; commercial and general public use is not allowed.
REST ROTATION GRAZING SYSTEM	A grazing system in which some pastures within the allotment are deferred from grazing by livestock for an entire year. All pastures are deferred within the specified rotation of years.
RETENTION (VQO)	See Visual Quality Objectives (VQO).
RIGHT-OF-WAY	Land authorized to be used or occupied for the construction, operation, maintenance, and termination of a project facility passing over, upon, under, or through such land.
RIPARIAN AREAS	An area with distinctive resource values and characteristics that is comprised of an aquatic ecosystem, a riparian ecosystem, and adjacent upland areas that have direct effects

on the riparian and aquatic ecosystems. This includes floodplains, wetlands, and all areas within a horizontal distance of approximately 100 feet from the normal high water line of a stream channel, or from the shoreline of a standing body of water.

ROADED NATURAL APPEARING RECREATION SETTING	A classification of the recreation opportunity spectrum where timber harvest or other surface use practices are evident. Motorized vehicles are permitted on all or parts of the road system.
ROADLESS AREA	Undeveloped Federal land within which there are no improved roads or roads maintained for travel by means of motorized vehicles intended for highway use.
ROADLESS AREA REVIEW AND EVALUATION (RARE) II	The assessment of "primitive" areas within the National Forests as potential wilderness areas as required by the Wilderness Act. This refers to the second such assessment which was documented in the final environmental impact statement of the Roadless Area Review and Evaluation, January 1979.
ROTATION	The planned number of years between the formation or generation of trees and their harvest at a specified stage of maturity.
RPA	See Forest and Rangeland Renewable Resources Planning Act.

S

SAWTIMBER	Trees containing at least one 12-foot sawlog or two noncontiguous 8-foot logs, and meeting regional specifications for freedom from defect. Softwood trees must be at least 9 inches in diameter and hardwood trees 11 inches in diameter at breast height.
SEDIMENT	Solid material, both mineral and organic, that is in suspension, being transported, or has been moved from its site of origin by air, water, gravity, or ice.
SEEDLING/ SAPLING	A forest successional stage in which trees less than 5 inches in diameter are the predominant vegetation.
SEISMIC EXPLORATION	Seismic exploration is used to map underground geological features to obtain more reliable information on the earth's subsurface and to localize areas where accumulations of oil and gas might occur. Seimic waves, generated at or near the surface, penetrate the earth's crust and reflect from subsurface rock layers back to the surface. The geophysicist receives a printed record or seismograph from which is measured the depth to various strata and from which subsurface structures with a potential for oil and gas accumulation can be determined such as faults, anticlines, and folds.

Portable - Where access limitations, topography, or other restraints prevent use of trucks, portable operations can be performed. Two portable techniques exist for collecting data. These are:

(1) Surface charge programs involve the detonation of a series of as much as 50 to 100 pounds of explosives at shot points located at intervals along the seismic line. Surface charges can be placed directly on the ground, on snow, or on a variety of stakes or platforms. All necessary equipment to conduct the operation is transported by helicopters and then conveyed by foot travel.

(2) Various kinds of portable drills can be backpacked or delivered by helicopter to the area. A shallow subsurface portable program would involve drilling a pattern of approximately 16 holes about 4 inches in diameter up to 50 feet deep per mile of line. At this depth, a 10 to 40 pound charge of explosive is placed and detonated. Recording cables and geophones are laid out by foot travel.

With both of these portable techniques, shock waves generated by detonation are received and transmitted via geophones and cable to a recording device. Portable methods are generally used on the Forest.

Conventional - The conventional method of collecting seismic data includes the use of truck-mounted drills and vehicle-supported crews and generally involves off-road travel. This technique involves drilling 5 to 18 5-inch diameter holes per mile to a depth of 180 to 200 feet. At this depth, a 10 to 100 pound explosive charge is placed and detonated. Shock waves are received and transmitted via geophones and cable to a truck-mounted recording device. Due to terrain restrictions, this method has limited application on the Forest.

Vibroseis - The vibroseis technique involves using truck-mounted hydraulic pads which generate energy waves through vibration rather than explosives. The vibrator method typically consists of four large trucks each equipped with a vibrator (a steel slab weighing about three tons) mounted between the front and back wheels. The vibrator pads (about 4 feet square) are lowered to the ground and vibrators on all trucks are triggered electronically from the recorder truck. Energy waves are received and transmitted via cable and geophones to a recorder truck. After the information is recorded, the trucks move forward a short distance and the process is repeated. The vibroseis operation is usually limited to roads and gentle terrain.

	Gravity - Gravity surveys generally involve vehicle-supported operations in which gravity-density variations are measured by use of surface instruments. These surveys are also usually limited to roads and gentle terrain.
SELECTION HARVEST	The annual or periodic removal of trees (particularly mature trees), individually or in small groups, from an uneven-aged forest in order to realize the yield and establish a new crop of irregular constitution.
SEMI-PRIMITIVE RECREATION SETTING	A classification of recreation opportunity spectrum that characterizes a predominately natural or natural appearing environment of a moderate to large size. Concentration of users is low, but there is often evidence of other area users. The area is managed in such a way that minimum onsite controls and restrictions may be present, but are subtle.
SERAL	A biotic community which is developmental; a transitory stage in an ecologic succession toward climax.
SHELTERWOOD CUTTING	Designed to establish a new crop under a remaining portion of the old stand, providing both a seed source and protection of the site and seedlings.
SILVICULTURE	The art and science of growing and tending forest trees.
SILVICULTURAL EXAMINATION	The process used to gather the detailed in-place field data needed to determine management opportunities and direction for the timber resource within a small subdivision of a forest area such as a stand.
SILVICULTURAL SYSTEMS	A management process whereby forests are tended, harvested, and replaced, resulting in a forest of distinctive form. It includes all cultural management practices performed during the life of the stand such as regeneration cutting, fertilization thinning, improvement cutting, and use of genetically improved tree seeds and seedlings to achieve multiple resource benefits. Systems are classified according to the method of carrying out the fellings that remove the mature crop and provide for regeneration and according to the type of Forest they produce.
SITE PREPARATION	A general term for removing unwanted vegetation, slash, and even roots and stones from a site before reforestation.
SITE PRODUCTIVITY	Production capability of specific areas of land. On forested lands is generally expressed in cubic feet per acre per year of mechantable wood products.
SLASH	The residue left on the ground after felling and other silvicultural operations and/or accumulating there as a result of storm, fire, girdling, or poisoning.

SMALL GAME	Birds and small mammals permitted for hunting or trapping.
SPECIAL-USE PERMIT	A permit issued under established laws and regulations to an individual, organization, or company for occupancy or use of National Forest land for some special purpose.
STAGNATION	A condition where individual tree growth within a stand is restricted by overstocking, disease, or competition for available sunlight or soil nutrients.
STAND	An aggregation of trees or other vegetative growth occupying a specific area and sufficiently uniform in composition (species), age arrangement, and conditions as to be distinguishable from the other growth on adjoining lands.
STOCKING	A measure of timber stand density or the number of trees per acre.
STREAM ORDER	A measure of the position of a stream in the hierarchy of tributaries. (Stream as referenced here refers to perenniel streams.) a. First-order streams are unbranched streams, that is they have no tributaries. b. Second-order streams are formed by the confluence of two or more first-order streams. They are considered second-order until they join another second-order or larger stream. c. Third-order streams are formed by the confluence of two or more second-order streams. They are considered third-order until they join another third-order or larger stream.
SUCCESSIONAL STAGE	A phase in the gradual supplanting of one community of plants by another.
SUITABILITY	The appropriateness of applying certain resource management practices to a particular area of land, as determined by an analysis of the economic and environmental consequences and the alternative uses foregone. A unit of land may be suitable for a variety of individual or combined management practices.
SUITABLE FOREST LAND	Forest land (as defined in CFR 219.3) for which technology is available that will ensure timber production without irreversible resource damage to soils, productivity, or watershed conditions; for which there is reasonable assurance that such lands can be adequately restocked (as provided in CFR 219.14); and for which there is management direction that indicates that timber production is an appropriate use of that area.

SUSTAINED YIELD	The achievement and maintenance in perpetuity of a high-level annual or regular periodic output of the various renewable resources of the National Forest without impairing the productivity of the land.
SYSTEM ROADS	Roads that are part of the Forest development transportation system, which includes all existing and planned roads, as well as other special and terminal facilities designated as Forest development transportation facilities.

T

TEMPORARY ROADS	Roads which are constructed for a one time or short term use which are not expected to be utilized in the future. These roads will be obliterated after the need is past.
THERMAL COVER	Cover used by animals to ameliorate effects of weather; for elk, a stand of coniferous trees 40 feet or taller with an average crown closure of 70 percent or more.
THREATENED AND ENDANGERED SPECIES	A species or subspecies of animal or plant whose prospects of survival and reproduction is in immediate jeopardy or likely to become so within the foreseeable future. Threatened species are identified by the Secretary of the Interior in accordance with the 1973 Endangered Species Act.
TIMBER BASE	The lands within the Forest capable, available, and suitable for timber production.
TIMBER HARVEST SCHEDULE	The quantity of timber planned for sale and harvest, by time period, from the area of land covered by the Forest Plan. The first period, usually a decade, of the selected harvest schedule provides the allowable sale quantity. Future periods are shown to establish that sustained yield will be achieved and maintained.
TIMBER STAND IMPROVEMENT (TSI)	All noncommercial intermediate cuttings and other treatments to improve composition, condition, and increment of a timber stand.
TRANSITORY RANGE FORAGE	Range forage produced following the removal of overstory vegetation, usually through timber harvest. Forage in these areas may be available for permitted use by domestic livestock for a period of time until overstory vegetation supplants the site.
TREE OPENING	An opening in the forest cover created by the application of even-aged silvicultural practices.

U

UNEVEN-AGED MANAGEMENT	The application of a combination of actions needed to simultaneously maintain continuous high-forest cover, recurring regeneration of desirable species, and the orderly growth and development of trees through a range of diameter or age classes to provide a sustained yield of forest products. Cutting is usually regulated by specifying the number or proportion of trees of particular sizes to retain within each area, thereby maintaining a planned distribution of size classes. Cutting methods that develop and maintain uneven-aged stands are single-tree selection and group selection. Individual Tree Selection Cutting - Involves the removal of selected trees of all size classes on an individual basis. Group Selection Cutting - Involves the removal of selected trees of all size classes in groups of a fraction of an acre up to 5 acres in size.
UNREGULATED HARVEST	This harvest is not charged against the allowable sale quantity. It includes occasional volumes removed that were not recognized in calculations of the allowable sale quantity, such as cull or dead material and noncommercial species and products. It also includes all volume removed from nonsuitable areas. Harvests from nonsuitable areas will be programmed as needed to meet multiple use objectives other than timber production and for improvement of administrative sites.
UNSUITABLE TIMBER LAND	Lands not selected for timber production in the Forest Plan alternative due to (1) the multiple-use objectives for the alternative preclude timber production, (2) other management objectives for the alternative limit timber production activities to the point where management requirements set forth in 36 CFR 219.27 cannot be met and (3) the lands are not cost-efficient over the planning horizon in meeting forest objecttives that include timber production. Land not appropriate for timber production shall be designated as unsuitable in the preferred alternative and Forest Plan.
UTILITY CORRIDOR	Corridor of land which is designated for energy transmission lines.
UTILIZATION STANDARDS	Standards guiding the use and removal of timber. They are measured in terms of diameter at breast height (d.b.h.) and top of the tree inside the bark (top d.i.b.) and the percentages of "soundness" of the wood.

V

VALUE, MARKET	The unit price of an output normally exchanged in a market after at least one stage of production, expressed in terms of what people are willing to pay as evidenced by market transactions.
VISUAL QUALITY OBJECTIVE (VQO)	A desired level of excellence based on physical and sociological characteristics of an area. Refers to the degree of acceptable alterations of the characteristic landscape. Preservation: In general, human activities are not detectable to the visitor. Retention: Human activities are not evident to the casual Forest visitor. Partial Retention: Human activities may be evident, but must remain subordinate to the characteristic landscape. Modification: Human activity may dominate the characteristic landscape but must, at the same time, utilize naturally established form, line, color, and texture. It should appear as a natural occurrence when viewed in middle-ground or background. Maximum Modification: Human activity may dominate the characteristic landscape, but should appear as a natural occurrence when viewed as background. Enhancement: A short-term management alternative which is done with the express purpose of increasing positive visual variety where little variety now exists.

BIBLIOGRAPHY

BIBLIOGRAPHY

mman, Gene D.; McGregor, Mark D.; Cahill, Donn B. and Klien, William H.
1977. Guidelines for reducing losses of lodgepole pine to the mountain pine beetle in unmanaged stands in the Rocky Mountains. USDA-Forest Service Gen. Tech. Rep. INT-36. 19 pp. Intermountain For. and Range Exp. Sta., Ogden, UT.

Bennett, K. A.
1982. Effects of slash burning on surface soil erosion rates in the Oregon Coast Range. Corvallis, OR: Siuslaw Forest, Forest Service, USDA.

ethlahmy, Nedavia.
1967. Effects of exposure and logging on runoff and erosion. Research note INT-61. Ogden, UT: Intermountain Station, Forest Service, USDA.

Bonneville Power Administration.
1973. Pacific Northwest long range east-west energy corridor study, phase I (draft), part A-Rocky Mountains, part B-Cascade Mountains. BPA.

oussu, M.F.
1954. Relationship between trout populations and cover on a small stream. Journal of Wildlife Management. (18) pp. 229 - 239.

oyce, R. C.
1975. Sediment routing with sediment delivery ratios. In: Present and prospective technology for predicting sediment yields and sources. Proceedings of the Sediment Yield Workshop, USDA Sedimentation Laboratory, Oxford, MS., Nov. 28-30, 1972. USDA, Agric. Res. Serv., ARS-S-40.

urns, Russel M.
1983. Silvicultural systems for the major forest types of the United States. Agric. Handb. 445. Washington, DC: U.S. Department of Agriculture, Forest Service; 1983. 191 p.

line, R., Cole, G., Megahan, W., Patten, R., Potyondy, J.
1980. Guide for predicting sediment yields. USDA-Forest Service, Northern and Inter-Mountain Regions, Missoula, MT.

onway, Steve
1976. Logging practices: principles of timber harvesting systems. Miller, Freeman, San Francisco, CA.

ullen, Steve; Montagne, Cliff.
1981. Soil compaction study. Missoula, MT.: Northern Region, Forest Service, USDA and Montana State University.

aniels, T.W.; Helms, John A.; Baker, Frederick S.
1979. Principles of silviculture. 500 pp. McGraw-Hill, New York NY.

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BIBLIOGRAPHY

Amman, Gene D.; McGregor, Mark D.; Cahill, Donn B. and Klien, William H.
1977. Guidelines for reducing losses of lodgepole pine to the mountain pine beetle in unmanaged stands in the Rocky Mountains. USDA-Forest Service Gen. Tech. Rep. INT-36. 19 pp. Intermountain For. and Range Exp. Sta., Ogden, UT.

Bennett, K. A.
1982. Effects of slash burning on surface soil erosion rates in the Oregon Coast Range. Corvallis, OR: Siuslaw Forest, Forest Service, USDA.

Bethlahmy, Nedavia.
1967. Effects of exposure and logging on runoff and erosion. Research note INT-61. Ogden, UT: Intermountain Station, Forest Service, USDA.

Bonneville Power Administration.
1977. Pacific Northwest long range east-west energy corridor study, phase 1 (draft), part A-Rocky Mountains, part B-Cascade Mountains. BPA.

Boussu, M.F.
1954. Relationship between trout populations and cover on a small stream. Journal of Wildlife Management. (18) Pg. 229 - 239.

Boyce, R. C.
1975. Sediment routing with sediment delivery ratios. In: Present and prospective technology for predicting sediment yields and sources. Proceedings of the Sediment Yield Workshop, USDA Sedimentation Laboratory, Oxford, MS., Nov. 28-30, 1972. USDA, Agric. Res. Ser., ARS-S-40.

Burns, Russel M.
1983. Siivicultural systems for the major forest tyupes of the United States. Agric. Handb. 445. Washington, DC: U.S. Department of Agriculture, Forest Service; 1983. 191 p.

Cline, R., Cole, G.; Megahan, W.; Patten, R.; Potyondy, J.
1980. Guide for predicting sediment yields. USDA-Forest Service, Northern and Inter-Mountain Regions, Missoula, MT.

Conway, Steve
1976. Logging practices: principles of timber harvesting systems. Miller, Freeman, San Francisco, CA.

Cullen, Steve; Montagne, Cliff.
1981. Soil compaction study. Missoula, MT., Northern Region, Forest Service, USDA and Montana State University.

Daniels, T.W.; Helms, John A.; Baker, Frederick S.
1979. Principals of silviculture. 500 pp. McGraw-Hill, New York NY.

Davis, N.M.
1978. West Creek soil compaction study. Hamilton, MT: Northern Region, Forest Service, USDA.

DeByle, Norbert V.; Packer, Paul E.
1972. Plant Nutrient and soil losses in overland flow from burned forest clearcuts. National Symposium on Watersheds in Transition.

Dryness, C. T.
1967. Mass soil movement in the H.J. Andrews Experimental Forest. Research paper PNW-42. Portland, OR: Pacific Northwest Station, Forest Service, USDA.

Dryness, C. T.
1976. Effects of wildfire on soil wettability in the high Cascades of Oregon. Research paper PNW-202. Portland, OR: Pacific Northwest Station, Forest Service, USDA.

Fauss, D. L.; Pierce, W. R.
1969. Stand conditions and spurce budworm damage in a western Montana Forest. J. For. 67(5): 322-325.

Frear, S. T.
1982. Ecological benefits of large woody debris in streams. Fort Collins, CO: Rocky Mountain Station, Forest Service, USDA.

Fredriksen, R. L.
1970. Erosion and sedimentation following road construction and timber harvest on unsuitable soils in three small western Oregon watersheds. Research paper PNW-104. Portland, OR: Pacific Northwest Station, Forest Service, USDA.

Froelich, H. A.
1979. Soil compaction from logging equipment: effects on growth of young ponderosa pine. Journal of Soil and Water Conservation 34:276-278.

Froelich, H. A.
1979. The effect of soil compaction by logging on Forest productivity. Corvallis, OR: Oregon State University.

Froelich, H. A.; Cafferata, P.; Azevedo, J.
1980. Predicting soil compaction on forest land. Final project report. Portland, OR: Pacific Northwest Station, Forest Service, USDA and Missoula Equipment and Development Center, Forest Service, USDA.

Furniss, R. L.; Coronlin, V. M.
1977. Western forest insects. Forest Service miscellaneous publications 1339. Washington, DC: Government Printing Office.

Garn, H. S.
1974. Water quality and analysis procedure and forest management guidelines protect the hydrologic effects of forest cover alternation. Hamilton, MT: Bitterroot Forest, Forest Service, USDA.

Glassy, J. M.; Svalberg, T. L.
1982. Effects of intense dozer pile burns on soils on the Kootenai National Forest. Libby, MT: Kootenai Forest, Forest Service, USDA.

Klock, Glen O.
1975. Impact of five post fire salvage logging systems on soils and vegetaion. Reprint. Journal of Soil and Water Conservation 30(2).

Lloyd, J.R.
1983. Development and methodology for showing the values that Forest Service streams have on downstream fisheries - a model. Unpub. Gallatin National Forest, USDA.

Lyon, L. J.
1979. Habitat Effectiveness for elk as influenced by road and cover. Journal of Forestry 77(10).

Lyon, L. J.
1979. Influence of logging and weather on elk distribution in western Montana. Research paper INT-236. Ogden, UT: Intermountain Station, Forest Service, USDA.

Meganan, W. F.
1974. Erosion over time on severely disturbed granitic soils: a model. Research paper INT-156. Ogden, UT: Intermountain Station, Forest Service, USDA; 1974.

Megahan, W. F.
1975. Sedimentation in relation to logging activities in the mountains of central Idaho. U.S. Agr. Res. Serv. Rep. ARS-S-50.

Megahan, W. F.
1980. Effects of silvicultural practices on erosion and sedimentation in the interior west--a case for sediment budgeting. Spokane, WA: Interior West Watershed Management Symposium.

Megahan, W. F.; Kidd, W. J.
1972. Effects of logging and logging roads on erosion and sediment deposition from steep terrain. Journal of Forestry 70(3):136-141.

Megahan, W. F.
1976. Tables of geometry for low standard roads for watershed management considerations, slope staking, and end areas. USDA, Forest Service, General Technical Report INT-32, Intermountain Forest and Range Experiment Station, Ogden, UT. 84401.

Peterson, Kathleen M.
1983. Vascular plants of rare and undetermined status for the State of Montana. Montana Rare Plant Project.

Pfister, Robert D.; Kovalchik, Bernard L.; Arno, Steven F.; Presby, R. C.
1977. Forest habitat types of Montana. General technical report INT-34. Ogden, Utah: Intermountain Forest and Range Experiment Station, Forest Service, USDA.

Phillips, R. W.
1971. Effects of sediment on the gravel environment and fish production. Corvallis, OR: Oregon State University, Symposium of Forest Uses and Stream Environment Proceedings.

Platts, W. S.
1971. Livestock grazing and riparian/stream ecosystems - an overview. Proceedings of a Forum, Grazing and Riparian Stream Ecosystems. Trout Unlimited, Inc.

Platts, W. S.
1980. The effects of logging on the aquatic habitat of the South Fork Salmon River, Idaho. Ogden UT: Intermountain Region, Forest Service, USDA.

Rice, R. M.
1981. A perspective on the cumulative effects of logging on streamflow and sedimentation. Berkely, CA: Proceedings, Edgebrook Conference.

Rice, R. M.; Rothacher, J. S.; Megahan, W. F.
1972. Erosional consequences of timber harvesting: an appraisal. National Symposium on Watersheds in Transition.

Ritchie, J. C.
1972. Sediment, fish and fish habitat. Journal of Soil and Water Conservation 27:145-125.

Schuster, Ervin G.; Jones, J.Greg.
1985 Below-Cost Timber Sales: Analysis of a Forest Policy Issue. USDA Intermountain Research Station, General Technical Report INT-183.

Smith, David Martyn
1962. The practice of silviculture, 7th ed. 578 pp. John Wiley and Sons, New York, NY.

Snyder, G. G.; Houpt, H. F.; Belt, G. M., Jr.
1975. Clearcutting and burning slash alter quality of stream water in northern Idaho. Research paper INT-168. Ogden, UT: Intermountation Station, Forest Service, USDA.

Thrush, P. W.
1968. A dictionary of mining, mineral, and related terms: U.S. Bureau of Mines.

U.S. Department of Agriculture, Forest Service
n.d. Air Quality Around Federal Class I Areas. Washington D.C., Forest Service, USDA.

U.S. Department of Agriculture, Forest Service
1978. A Holistic Approach to Wildlife and Fish Habitat Management, Dillon, MT: Beaverhead National Forest, Forest Service , USDA.

U.S. Department of Agriculture, Forest Service.
1978. Effects of fire on soil. General Technical Report WO-7. Washington, DC: Forest Service, USDA.

U.S. Department of Agriculture, Forest Service.
1982. Esthetic effects of prescribed burning: a case study. Fort Collins, CO: Rocky Mountain Station, Forest Service, USDA.

U.S. Department of Agriculture, Forest Service.
1973. Forest hydrology--hydrologic effects of vegetation minipulation, part II. Missoula, MT: Northern Region, Forest Service, USDA.

U.S. Department of Agriculture, Forest Service.
1983. Forest insect and disease conditions in 1982 in Montana. General Technical Report 83-2. Missoula, MT: Northern Region, Forest Service, USDA.

U.S. Department of Agriculture, Forest Service.
1984. Guide for predicting salmonid response to sediment yields. Missoula, MT: Northern Region/Intermountain Region, Forest Service, USDA.

U.S. Department of Agriculture, Forest Service.
1980. Guidelines for predicting sediment yields from forested watersheds. Northern Regiona, Intermountain Region, Forest Service, USDA.

U.S. Department of Agriculture, Forest Service.
1981. Influence of forest and rangeland management on anadramous fish habitat in western North America. Effects of mining.

U.S. Department of Agriculture, Forest Service.
n.d. Land managers handbook on minerals management. FSH-2809.11, Forest Service, USDA.

U.S. Department of Agriculture, Forest Service.
1982. Montana Cooperative Elk-Logging Study, Annual Program Report. Missoula, MT: Northern Region, Forest Service, USDA.

U.S. Department of Agriculture, Forest Service.
1974. National Forest landscape Management Vol. 2, Chapter 1, The visual management system. FSH-462. Forest Service, USDA.

U.S. Department of Agriculture, Forest Service.
1983. Northern Region Guide. Missoula, MT., Northern Regional, Forest Service, USDA.

U.S. Department of Agriculture, Forest Service.
1974. Recreation opportunity inventory and evaluation. Northern Region, R-1 74-006. Forest Service, USDA.

U.S. Department of Agriculture, Forest Service.
1979. Roadless area review and evaluation final environmental statement, FS-325. Washington, DC: Forest Service, USDA.

U.S. Department of Agriculture, Forest Service.
1982. SEAM users guides to engineering, soils, sociology and economics, wildlife, and hydrology for mining and reclamation in the west. Forest Service, USDA.

U.S. Department of Agriculture, Forest Service.
1980. Timber. Chapter 5 in National Forest landscape management, vol. 2. Agric. Handbook No. 559. 223 pp. Washington, DC.

U.S. Department of Agriculture, Forest Service.
1979. Wildlife Habitats in Managed Forests, the Blue Mountains of Oregon and Washington. Agriculture Handbook No. 553.

U.S. Department of Interior, Fish and Wildlife Service.
1977. American peregrine falcon Rocky Mountain and Southwest population recovery plan. Washington, DC: Peregrine Falcon Team, Fish and Wildlife Service, USDI.

U.S. Department of Interior, Fish and Wildlife Service.
1982. Grizzly bear recovery plan. Fish and Wildlife Service, USDI and Montana Department of Fish, Wildlife and Parks.

U.S. Department of Interior, Fish and Wildlife Service.
1983. Technical review draft revised northern Rocky Mountain wolf recovery plan. Fish and Wildlife Service, USDI.

U.S. Department of Interior, Fish and Wildlife Service.
1984. Proposed threatened and endangered species. Helena, MT: Endangered Species Office, Fish and Wildlife Service, USDI.

Wykoff, William R.; Crookston, Nicholas L.; Stage, Albert R.
1982. User's guide to the Stand Prognosis Model. Gen. Tech. Rep. INT-133. Ogden UT: U.S. Department of Agriculture, Forest Service, Intermountain Forest and Range Experiment Station; 1982.

APPENDIX A

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APPENDIX A

Introduction

The following pages describe the process used by the Forest in identifying the issues, concerns, and opportunities to be addressed in the Forest planning process. The agencies and individuals with whom the Forest consulted in the process are also listed, and a brief synopsis of the discussions with each agency/individual is presented. The third portion of the appendix presents the major issues that were selected to be addressed in the Forest Plan. Resource relationships and procedures to address the issues are discussed.

APPENDIX A

Identification of Issues, Concerns and Opportunities

I. Process

A preliminary identification of 137 issues, concerns, and opportunties (ICO's) was completed in March 1979. Past planning actions, public involvement activities, a review of newspaper articles and other National Forests' ICO's, and current management concerns led to the original listing. This list was reduced to 16 ICO's using the following criteria:

- The Forest must be able to address/resolve the ICO through the Forest Plan
- The ICO must affect more than one Ranger District or be of widespread interest
- Resolution of the ICO must be long-term (take more than one year)

The notice of intent to prepare a Forest Plan and Environmental Statement was published in the Federal Register in August, 1980. Forest employees were asked to review the 16 ICO's and complete a response pamphlet. In October, 1980 a public brochure containing the 16 ICO's was sent to approximately 1200 addressees, including landowners, permittees, representatives of business and industry who have previously expressed interest in Forest activities and planning efforts, special interest groups and others. Eighty-seven responses were received in reply to the brochure. The majority of replies came from the private landowner/private citizen sector (59) with the remaining replies almost equally distributed between business and industry (primarily timber and ranching), environmental/conservation groups and government agencies. A letter was sent to intermingled landowners inviting their coordination during the planning process. A news release and legal notice were also published in an effort to reach any interested parties that might have been missed in the mailings.

A public open house was held in October, 1980 in Dillon to provide members of the public an opportunity to meet with Forest officials to review and discuss the issues. All members of the public, including women and minorities, were encouraged to attend and make comments. Twenty-eight people attended this meeting. Over half of the attendees represented business and industry (primarily timber and ranching), and the majority of others were from the private landowner and community sectors.

The public responses were used by Forest interdisciplinary (ID) team to assist in screening the ICO's resulting in the combination/selection of five major ICO's to be addressed in the Plan. Problem statements were then written for each of these. Due to the increased public interest in minerals and energy resources and recent exploration and development activities on the Forest, a sixth ICO for minerals was added shortly after the initial five where finalized and reviewed by the Forest Service Northern Regional Office.

The Beaverhead National Forest released a Draft Environmental Impact Statement (DEIS) and Forest Plan on April 27, 1982. Between April 27 and September 16 of that year when the comment period ended, Forest officials participated in numerous meetings and several field trips with interested citizens and groups. The Forest received over 200 written comments on the Proposed Forest Plan and DEIS. Comments were reviewed by members of the Forest ID Team, and were submitted to a thorough content analysis process. In this process comments were summarized. Most concerns centered around the issues that had already been identified for the planning process, the technical nature of and analysis done for the Draft EIS, resource impacts and opportunities, and land management designations made in the Forest Plan. The ID team determined that some concerns were to be resolved by changes in the types of management to be applied to specific areas, some would be resolved by revisions in and/or refinements in the standards set forth in the Forest Plan, and some would be resolved by refinements in analysis done for, corrections to, and clarifications in the Environmental Impact Statement. It was also determined that some of the comments made in response to the DEIS and Forest Plan were statements of philosophy which were to be considered as the Plan was being finalized but for which no formal response was needed.

The Forest had already begun to develop the Final Plan and EIS when, in September 1983, the NFMA regulations were amended to require each Forest to prepare, using specific criteria, an inventory of roadless lands and to evaluate each of these areas for wilderness in its land and resource planning process. The Forest's planning process had, until that time, assumed that RARE II process would resolve wilderness designation of the inventoried roadless lands and that the Montana Wilderness Study Act and the Lee Metcalf Wilderness Bill would resolve the wilderness questions in the West Pioneer and Taylor-Hilgard (Madison) areas, respectively. Thus, wilderness had not been included in the 1982 DEIS as a public issue. In order to respond to the revised NFMA regulations, the Forest decided to add a seventh issue addressing wilderness and to incorporate a re-evaluation of the inventoried roadless lands in the planning process. This necessitated issuance of a "revised" Draft EIS that included analysis of the wilderness issue as well as the other six issues identified for the Forest.

In September of 1983 the Forest issued a "Roadless Area Evaluation" brochure, in which the public was asked to help clarify the wilderness issue, assist in compiling information regarding the inventoried roadless lands on the Forest, and help to identify management options for these inventoried roadless lands. This brochure was sent to approximately 750 addressees on the Forest mailing list. Approximately 10 percent of the people who were sent the brochure responded in writing. About 40 percent of the responses were from individuals, people who did not identify themselves as representatives of any group, organization, or business. The Forest also heard from several government agencies (Federal, State, and County), and from representatives of energy and nonenergy minerals interests, environmental/recreational groups, and timber industry. Wilderness proponents commented, as a whole, in favor of areas which had been traditionally supported since RARE II, with a few additions. Commentors from the mineral/energy and timber industries opposed wilderness designation for areas with high energy/nonenergy development potential. Comments pertaining to all inventoried roadless areas in general were fairly evenly divided. Numerous comments supported wilderness designations for much or all of the Forest's inventoried roadless lands. Almost as many respondents clearly supported keeping the Forest "as roadless as possible" without necessarily designating lands as wilderness. A similar number of respondents indicated that they were not in favor of further wilderness designations, that they favored nonwilderness for inventoried roadless areas, or that inventoried roadless areas would retain their values without formal designation.

The Revised Draft EIS and Proposed Forest Plan Supplement were filed with the Environmental Protection Agency and made available to the public on January 4, 1985. A Notice of Availability was published in the Federal Register on January 19, 1985. News releases were also prepared for the media in Dillon and throughout most of

Montana. The release of the documents was also announced by some Idaho media. About 70 copies of the Plan Supplement, 110 copies of the "Overview" of the Proposed Forest Plan Supplement and Revised EIS and 160 copies of the entire set of documents were distributed to the people and organizations on the mailing list; 110 copies of the entire set of documents were sent to other Federal Agencies and elected officials. The deadline for submitting written comments was April 15, 1985. The Forest granted additional time for written comments, moving the deadline to May 1, 1985, because the notice was late in appearing in the Federal Register. Because the Forest received a number of requests for an extension, the comment period was then extended to June 1, 1985. The schedule for preparation of the Plan and Final EIS was such that it was possible to consider all written comments received by June 11, 1985, even though some comments were received after the comment period closed.

Five "Open Door" sessions and three press briefings were scheduled between the release of the Revised Draft and the close of the comment period to present the Proposed Plan and to answer questions. An "Open Door" session was held on each District, except Sheridan, of the Beaverhead National Forest and in Butte, Montana. In all, about 140 people attended these "Open Door" sessions. In addition, members of the planning team presented the Proposed Plan at numerous meetings of service and special interest groups and met with individuals in and around Dillon and in Helena, Anaconda, Butte, and Missoula. Records of these meetings and "Open Door" sessions are available at the Forest Supervisor's Office in Dillon. Individual Rangers and other members of the interdisciplinary team met with interested groups and individuals during the public review period to explain the Plan.

In 1985, the Forest received 772 written comments during the formal public comment period, including 198 postcards, 59 form letters and 34 multiple signature letters, from interested people and organizations. In addition, the Forest received 50 written comments after the close of the public comment period, including 3 postcards, 28 form letters and 1 multiple signature letter. (These comments were not included in our analysis; however, the Forest is sending each of these commentors a letter of response to his or her comments.) Much of the concern expressed in the comments centered on the issues of timber harvest, road construction, wilderness proposals, and road concern, particularly the water quality of the Big Hole drainage. Others expressed concern about the land management assignments made and resource costs and values and assumptions that were used in the process. As with the comments received on the 1982 Draft, the ID team determined that some concerns would be resolved by changes in the types of management to be applied to specific areas, some would be resolved by revisions in and/or refinements in the standards set forth in the Final Forest Plan, and some would be resolved by refinements in analysis done for, corrections to, and clarifications in the Environmental Impact Statement. The team also determined that some of the comments made in response to the Revised EIS and Plan Supplement were statements of philosophy which would be considered as the Plan was being finalized but for which no formal response would be prepared.

II. Consultation with Others

A. Agencies

1. Contacts

The following agencies are on the Forest Plan mailing list. A letter was sent to t State of Montana Clearinghouse and these agencies notifying them of the Forest Service's intent to develop a Forest Plan and Environmental Impact Statement:

Federal
- Bonneville Power Administration
- USDI Bureau of Land Management
- USDI Bureau of Reclamation
- USDI Fish and Wildlife Service
- USDI National Park Service
- USDI Geologic Survey
- US Department of Energy
- USDA Soil Conservation Service
- Upper Missouri River Basin Commission

State
- Montana Department of Natural Resources and Conservation
- Montana Department of Lands
- Montana Department of Highways
- Montana Department of Fish, Wildlife and Parks
- Montana Historical Society: Historic Preservation Office

County Commissioners and Planning Agencies
- Beaverhead County
- Madison County
- Silver Bow County
- Deerlodge County
- Gallatin County

2. Review of Plans

. The Montana Power Company; 1985 Long Range Plan, July 1985.
- Identifies ten year plan for development of electric transmission lines, energy, power generating and associated facilities.
- No conflicts were identified.

. Bonneville Power Administration; Pacific Northwest Long Range East-West Energy Corridor Study, Phase I, Part A, Rocky Mountains (DRAFT), December 1977.
- Identifies Rocky Mountain passes and RARE II studies for future East-West high capacity energy transmission corridors.
- No conflicts were identified.

. National Park Service; Lewis and Clark National Historic Trail - Comprehensive Plan for Management and Use, January 1982.
- Management objectives presented to develop the Lewis and Clark National Historic Trail (National Parks and Recreation Act of 1978, Public Law 95-625).
- Coordination with the National Park Service in the devlopment of the Lewis and Clark National Historic Trail.
- Identifies land trail from Gibbons Pass to State Highway 43.
- Identifies motor route to Sacajawea Campground and over Lemhi Pass.

. National Park Service; Big Hole National Battlefield Statement of Management, 5/79.
- Management objectives presented to maintain and restore the historical resources, make them accessible to the public, and to promote research of this battlefield.
- The Forest Plan will give consideration to the protection of the scenic values of the Big Hole National Battlefield and the related areas and will preserve that portion of the trail on National Forest land.
- The Forest will continue to acquire documents related to the theme and purpose of the Park.
- No conflicts were identified.

. Madison County Planning Board; Comprehensive Plan for Madison County.
- No conflicts were identified.

. Montana Department of Fish, Wildlife and Parks; 1978 Montana State-wide Comprehensive Outdoor Recreation Plan (SCORP).
- Sets harvest goals for elk, mule deer, bighorn sheep, moose, and mountain goat. Outlines strategies for managing these species, including:
    - Road closures and walk-in hunting areas.
    - Use of elk-logging study recommendations when planning timber sales.
    - Build a minimum number and standard of roads.
- Need of Department and Federal agencies to cooperate.

The Forest will coordinate with officials from the Department of Fish, Wildlife, and Parks throughout the planning process and incorporate guidelines and recommendations set forth in SCORP to the extent practicable in implementation of the Forest Plan.

- Soil Conservation Service, Annual Plan of Operations
  - -Need for SCS, Forest Service, and grazing permittees to cooperate, especially in the areas of wildlife-domestic livestock competition for winter range, and the need for stabilization of streambanks in overgrazed areas.

- Montana State University Cooperative Extension Service, "Project 80, What the People Said"
  - -Agencies cooperate to ensure optimum forage production on ranges.
  - -Recognize seriousness of spread of noxious weeds.
  - -Recognize and address the competition of wildlife and domestic livestock; stress the need to appreciate the contribution of the landowner and the values of wildlife as part of the quality of life.
  - -Manage timber for sustained yield and economic growth.
  - -Give all proposed wilderness areas very careful study before they are established.
  - -Encourage research to determine a feasible way of salvaging diseased and down timber.
  - -Maintain water quality.
  - -Implement mining with regard to long-term effects; continue research on the reclamation of mined areas.

- USDI, Bureau of Land Management, Butte District Office, "Mountain Foothills, Grazing Management Program Draft," February 1980.
  - -Protect and enhance the vegetation resource that provides the foundation for wildlife habitat, livestock forage, forestry products, watershed, recreation, and scenic resources.
  - -Allow operators to convert their present grazing operations to the desired kind of livestock--cattle and/or sheep--to stabilize the livestock industry.
  - -To increase the vegetal production within each allotment to be intensively managed.
  - -To permit big game movement by using only the minimum number of miles of fence necessary to implement grazing systems and by using the types of fence that allow for passage of big game, except on sheep allotments where more restrictive fencing is required.
  - -To protect primitive and scenic values.
  - -To increase stream channel stability and decrease sediment load and maintain or improve fish habitat in area streams.

- USDI, Bureau of Land Management, Montana State Office, Billings, "Montana Initial Wilderness Inventory," August 1979.
  - -Need identified to coordinate Forest inventoried roadless area and wilderness area studies where lands are contiguous with BLM areas.

B. Other Consultations

Contact: Montana Department of Fish, Wildlife and Parks
Discussions: Economic evaluation of recreation pursuits, particularly hunting and fishing. Display of hunter opportunity related to habitat security. Water quality impacts of streams, particularly sediment impacts on fish. Road access relative to security cover and stream fisheries. Fish and wildlife objective. Impact of Forest practices on wildlife. Delineation of wildlife habitat. Relate the State's harvest

data to habitat changes and elk numbers. Establish big game population figures for the Forest. Grey wolf habitat delineation.

Contact: Salmon National Forest
Discussion: Coordination of planning efforts. Status of planning on the Salmon National Forest. West Big Hole Area. Freeman Creek Timber Sale. Continental Divide Trail. Elk RPA Objectives. Off-Road Vehicle Plan on the Salmon National Forest. An approach to coordinate the cumulative effects of management on the wolf populations. Contiguous inventoried roadless area planning.

Contact: Targhee, Deerlodge, and Bitterroot National Forests
Discussions: Coordination of planning efforts. Coordination of planning for contiguous inventoried roadless areas.

Contact: USDI, Fish and Wildlife Service
Discussions: Coordination of planning efforts, specifically as related to wildlife.

Contact: State Officials (Governor's Forest Plan Review Committee)
Discussion: Briefing the Governor of Montana and other State officials on the Forest planning process and alternative actions being proposed. Discussion of Draft EIS and Forest Plan. Discussion of Governor's concerns related to Plan. Wildlife concerns, water quality. Values used in the process for recreation visitor days, primarily hunter days and fishing days.

Contact: Pat Williams, Montana Congressional Delegation
Discussions: Plan management area assignments, prescription concepts, special management areas, resource management opportunities and impacts.

Contact: Ruby Steering Group (Grazing Association)
Discussion: Range and wildlife management in the Proposed Forest Plan. Grazing intensities. Noxious weeds.

Contact: East Pioneer Steering Group (National Range Stewardship Association)
Discussion: Range and wildlife management. Grazing intensities and grazing allotments. Noxious weeds.

Contact: Big Hole Watershed Association, Hugh Zackheim
Discussion: Management area assignments in the Proposed Forest Plan. Water quality in the Big Hole drainage and other Forest streams.

Contact: Wildlife Federation (Tom France, Andy Stahl)
Discussion: Wildlife security and winter range. Forest Plan management area assignments. Recreation visitor days values. Economics of timber harvest. Timber quality and site productivity.

Contact: Montana Snowmobile Association (Nina Smith)
Discussion: Classification of snowmobiles (motorized, nonmotorized). Effects of management area assignments on snowmobile users. Recreation opportunities. McAtee Basin management area assignment and management.

Contact: Bureau of Land Management
Discussion: Coordination of fire management planning on bordering and intermingled lands. Inventoried roadless areas and proposed wilderness; contiguous areas.

Contact: Montana Department of Lands, Division of Forestry
Discussion: Effects of Forest planning on State lands.

Contact: Western Environmental Trade Association (Pete Jackson, Mike Marconi)
Discussion: Their concerns relative to the Forest planning process, primarily that minerals was not listed as a major concern. Concerned about developing some method of displaying the effects of the Plan alternatives on potential for minerals and oil and gas. Coordinated to produce an effects display useful to industry and the agency. How the Forest proposes to get more timber from fewer acres. Clarification of prescriptions - What is meant by the term "Custodial".

Contact: John Chaffin, Attorney
Discussion: Identification of timber management areas.

Contact: National Park Service; Al Schulmeyer, Superintendent of the Big Hole Battlefield
Discussion: Continued coordination between the Forest Service and the Battlefield.

Contact: USDI, BLM, Wilderness Study Area Open Houses
Discussion: Informational, regarding the Wilderness Study Areas adjacent to the Beaverhead National Forest.

Contact: Inland Forest Resource Council (Larry B. Blasing)
Discussion: Need for compliance with NEPA, NFMA, and RPA. Need for more thorough examination of community stability and dependent community impacts. Need for adequate forest resource inventories, yield tables, and logical aggregation of resource inventory data. Need for identification of economically optimum timber management regimes. Better documentation of baseline data and identification of economically efficient base runs. Additional alternatives to meet the final 1980 RPA Program targets. Consider utilization standards over time. Adequate documentation and analysis of inventoried RARE II areas and how they conform to the President's recommendations. Need for adequate communication with adjacent landowners and discussion of management strategies. Proper identification and analysis of riparian zones. Need for adequate documentation and analysis of technical management decisions, coefficients, and constraints.

Contact: Wilderness Society (later, the Montana Wilderness Association) (Bill Cunningham)
Discussion: Need to maintain a roadless resource "ledger." Need for development of previously undeveloped lands. Identification and mapping the location of all logging roads needed. Need for figures on size and value of noncommercial resources, such as wildlife, and for specific directions for their management. Need for continued high water quality. Need to assess and prepare for major population booms in rural areas and adjacent to the Forest due to possible major oil and gas and mineral discoveries. Need to regard economic analysis in land and resource planning. Need to discuss environmental impacts of land management planning alternatives in sufficient detail. Examine reasonable alternatives. Do an unbiased analysis of alternatives. Properly consider public comments on a plan. Re-analysis of inventoried roadless areas. Howell Creek road and timber sale. Wilderness proposals. Forest Plan management area assignments. Resource opportunities and impacts.

Contact: Blue Ribbons of Big Sky (Joel Shouse)
Discussion: Water quality, primarily in the West Fork of the Madison River. Sediment loads in Blue Ribbon Streams.

Contact: James Welch (Landowner in the West Big Hole Valley)
Discussions: North Big Hole Wilderness proposal. Howell Creek timber sale and road. Clam Valley. Timber harvest in the North Big Hole area.

Contact: Jack R. Cole (Canyon Creek Ranch)
Discussion: Wilderness recommendations in the East Pioneers

Contact: Earth First! (Dave Foreman and Howie Wolke)
Discussion: Inventoried roadless area management and wilderness recommendations for the Forest Plan.

Contact: Wilderness Institute (Colleen Harrington)
Discussion: Provided Colleen with information on oil and gas leasing and timber sale activities (current and proposed) in and WARS ratings (RARE II) for the West Pioneers roadless area.

Contact: Plum Creek Timber Company (formerly Burlington Northern Railroad - Lands Division) (Kathleen Cottingham)
Discussion: Need for consideration of adjacent and intermingled lands management. Need for landownership adjustment (land exchange). Need for public transportation facilities. Need for management of RARE II nonwilderness areas. Describe the goals or objectives that will be achieved under each management alternative to be evaluated in Forest planning. Implement economic analysis that will properly evaluate the costs and benefits of market and non-market goods and services.

Contact: Skyline Sportsmen (Tony Schoonen)
Discussion: Less emphasis on mining, timber, and road building at taxpayers' expense. Preserve some areas for recreation for all generations. Need for more public hearings and input into decisions on Forest policies. Reseed logged lands and reclaim mined areas.

Contact: F.H. Stoltze Land and Lumber (John Ulrich)
Discussions: Need to manage Forest land productively and efficiently. Meet and exceed RPA timber goals. Reduce high timber mortality losses, particularly from the mountain pine beetle. Meet community economic stability goals. Realize full Forest growth potential. Increase county income. Need to meet the nation's requirement for reasonably priced housing. Maintain and increase the land base devoted to timber production. Need to make timber supplies certain. Need to know the full opportunities for timber management, unconstrained by multiple-use constraints. Need to improve coordination between Forest Service and adjacent private landowners as far as grazing, access, ORV limitations, etc. Need for further water quality protection which is already adequately protected by State regulations and classification of rivers. Need for an accurate, comprehensive economic analysis of resource uses for all users. Forest Plan management area assignments. Intensity of timber harvest. Wilderness proposals. Proposed wilderness area boundary adjustments.

Contact: Beaverhead Forest Concerned Citizens (Al Luebeck)
Discussions: Need for development of previously undeveloped lands. Identification and mapping the location of all logging roads needed. Need for figures on size and value of noncommercial resources, such as wildlife, and for specific directions for

their management. Need for continued high water quality. Need to assess and prepare for major population booms in rural areas and adjacent to the Forest due to possible major oil and gas and mineral discoveries. Need to regard economic analysis in land and resource planning. Need to discuss environmental impacts of land management planning alternatives in sufficient detail. Examine reasonable alternatives. Do an unbiased analysis of alternatives. Properly consider public comments on a plan. Consult with the Fish and Wildlife Service if the Land Management Plan affects a threatened or endangered species. Use realistic levels of funding for a land management plan. Use appropriate timber stratification.

Contact: Beaverhead County Planning Department (Lee Tuott)
Discussion: Consider potential access problems. Preserve the multiple use concept. Consider new access that may open up areas to subdivision pressures in conflict with the County Comprehensive Plan and the best interests of the county. Address the future of water development on offstream sites located on the Forest. Maintaining a strong timber industry important to the economy of the County. Need to consider the social impacts of minerals and oil and gas leasing. Consider the severe effect on the economy caused by changes in the use of the Forest. Increase livestock grazing to help the economy of the County.

Contact: Trout Unlimited, Butte Chapter
Discussion: Need to regard economic analysis in land and resource planning. Need to discuss environmental impacts of land management planning alternatives in sufficient detail. Examine reasonable alternatives. Do an unbiased analysis of alternatives. Properly consider public comments on a plan. Consult with the Fish and Wildlife Service if the Land Management Plan affects a threatened or endangered species. Use realistic levels of funding for a land management plan. Use appropriate timber stratification.

Contact: Anaconda Sportsmen's Club (Lorrie Thomas)
Discussion: Need to regard economic analysis in land and resource planning. Need to discuss environmental impacts of land management planning alternatives in sufficient detail. Examine reasonable alternatives. Do an unbiased analysis of alternatives. Properly consider public comments on a plan. Consult with the Fish and Wildlife Service if the Land Management Plan affects a threatened or endangered species. Use realistic levels of funding for a land management plan. Use appropriate timber stratification.

Contact: Montana Power Company, James F. Walsh, Mary Sullivan (Environmental Department)
Discussion: Need to construct a transmission line over Forest Service land in Jack Creek.

Contact: Gallatin Wildlife Association
Discussion: Need to Protect wildlife and fish habitat in the Madison River drainage. Halt further development of the Jack Creek drainage.

Contact: Keith Rush, Outfitter and Guide
Discussion: Forest Plan management area assignments, outfitter and guide policies.

Contact: BEAVERHEAD SNOWRIDERS ASSOCIATION (Bill Mancoronal, Roxi Mancoronal, Arlo W. Herman, Rich Herman, Ed Hoerning, Park Scott, Dan Scott, Jim Schaeffer, David Markson, Stanley Shafer)

Discussion: Management of beetle infestation in wilderness areas. Don't want to see the timber go to waste. Fire management policies in the wilderness, particularly the "let burn" decision that may be made under certain conditions. Several members mentioned that they would like to see some recognition given to the differences in impacts caused by 3-wheel and 4-wheel trailcycles as opposed to 2-wheel cycles; because they tend to cause fewer and less damaging impacts than 2-wheelers. Would like to see as many roads closed as possible during the hunting season. Concerned that they did not want to see alot of high standard roads built, because this type of road encouraged access by more hunters. Generally the group opposes wilderness. Options to ride snowmobiles are limited by the wilderness designation. Once an area is designated wilderness, it can never be removed from the Wilderness System. Some opposed wilderness because they feel that there is enough wilderness now and that the percentage of people who actually use the wildernesses is too small to "tie up alot more land in that designation." Several members expressed a desire to see much of the Forest remain "the way it is now." They do not want alot of logging, but would rather see the trees used when they are ready for harvest than to have the "bugs" come in and have the timber go to waste.

Contact: NED WELBORN
Discussion: Draft Plan, Italian Peak Wilderness Proposal acceptable.

Contact: Open house at Wise River Ranger Station (2/19/85). List of Attendees: Jim Pizzadili (Louisiana Pacific), Dave Hammons (Louisiana Pacific) Frank Stanchfield (TF), Edith Stanchfield (TF), Nick Jensen, Scott Schonsberg, Keith Sims (Split Diamond), Tim Fay, Garvin R. Ferguson, Lowell Mallon (Rancher), Jim Gnose (Store Owner), Willie Ralston (Rancher), Palmer Bowen (Deerlodge N.F.), M. Edsall, Keith Jones (Rancher), Don Jones (Rancher), Liz Jones (Rancher), Merrill Davis (Deerlodge N.F.), Ellen Franko, Rich Franko, (Rancher), John Reinhardt (Rancher), Dean Stanchfield, Eddie Lou Stanchfield, Gene Spolar, Jan & Les Davis (Sundance Lodge), Carolyn Page (Alder Creek Ranch), Clifton Page (Alder Creek Ranch), David Decker (Outfitter), Ron Russell, Harry Grose, Van Stallman, Bob Bell, LaDonna Burroughs, Bill Turner, Jim Street, Mr. & Mrs. R. Schonsberg, Jr.
Discussion: Logging activity in new areas. Timber sale road reclamation after sale activities. Motorized winter recreation opportunities in West Pioneers. Cabins for recreation use. Closure of new timber sale roads,should be closed to the public following sale activities. Boundary for proposed East Pioneer Wilderness Area: should not be as close to Wise River Road as it is, and there should be motorized corridors leading into it so that people with motorcycles, etc. could get into the area. This would allow more use of the area by weekend recreationists. Enough timber has been harvested in the Granulated Mountain area for the present time. Remaining timbered areas are needed to provide elk hiding cover during hunting season. Concerned with MA 16 in upper Meadow Creek, Heart Park and Papoose Creek - these areas have good security cover areas where the elk could effectively get away from hunters. Anderson Meadows and Pattengail Creek areas should be left open for motor vehicle use if the West Pioneer area is classified as wilderness. Corridors should be left open for snowmobile use in the proposed East Pioneers Wilderness. Concerned with the MA 20 in the Pinedale - New Meadows area behind Granulated Mountain; concerned with elk security cover being maintained. Multiple use would be a more realistic plan for the East and West Pioneers; too many roads there now. Wilderness should establish itself. In Jerry Creek there is plenty of rangeland, just needs better management.

Contact: Missoula Media (Jase Laakso, KUFM, University of Montana; Cindy Boise and Steve Harris, KECI TV, Missoula; Kevin Mackay, MTN/KPAX TV)

Discussion: Press briefing on Proposed Forest Plan
Criteria used in determining elk considerations. Increasing the elk herd numbers. Roading in roadless areas; acres to remain roadless. Amount of roads needed for Plan implementation.

Contact: Regional Office Employees (Forest Service)
Discussion: Proposed Forest Plan presentation and questions.

Contact: Louise Seybolt (Lima Mayor)
Discussion: Forest Plan. Generally satisfied with current Direciton.

Contact: Leon Bernard (Hardware Store Owner)
Discussion: Forest Plan. He would like to see access to the continental divide planned through Middle Fork of Little Sheep Creek. This would allow access to his mining claims in the area. Basically in agreement with the Proposed Plan.

Contact: Lois Merrell (Lima City Clerk)
Discussion: Explained that there was not much change in management direction planned for the Lima area. Lois was comfortable with present direction.

Contact: Pat Hildreth
Discussion: Forest Plan. No problem with Italian Peak proposal.

Contact: Bennett and Nancy Owen (Trucking Company Owners) and Bernal Kahrs (Special Use permittee, Elkhorn Hot Springs)
Discussion: Proposed Forest Plan is generally okay. Have enough wilderness now; however, East Pioneer proposal is okay. Want to maintain logging program. Small timber sale in Blue Creek to obtain snowmachine access would be okay. The trail for snowmachines between Comet Ridge and the Elkhorn Road is good. Interested in helping with leveling the trail.

Contact: Red Kamp (Maverick Mountain Ski Area)
Discussion: No problem with Plan. East Pioneer ok. Small timber sale in MA-28 acceptable to establish snowmachine route through Blue Creek; should not remain open to wheeled vechiles.

Contact: Dillon Open Door Session.
Attendees: R.E. Marchesseau (Rancher), Benny A. Johnson (Rancher), Bernard Harkness (Rancher), Roger Cox (Stoltze Lumber), Michael Lyngholm (Stoltze Lumber), John B. Atkins, Bill Henson, Doug Hubbard, Neal Davis, Doyle Davis, John Banovich, Carter Butori, Parke Scott, Floyd Rebich, Maynard Smith, Bill Davison (Rancher)
Discussion: Post information on closures that could be implemented in the coming year's Travel Plan in the area that could be affected so the users are informed and can comment. Doesn't like the fact that so much of the Forest is closed to motorized access; would rather have a shorter season than more access restrictions. Concerned about the "spread" of existing wilderness areas. Should be no more wilderness in Montana and other people shouldn't make the decision for those of us who work and live here. Over use of wilderness defeats the purpose of calling something wilderness because it just draws more users. With the amount of wilderness we have in Montana, the remaining lands should be kept in multiple use. Road closures - there should be times during the day when you can drive in to retrieve game.
Answer: If you need a closure, you can't have retrieval "opening". Would be impossible to manage. Whenever wilderness borders private land, there should be a buffer - leave about 1 mile of non-wilderness.

Contact: Dick McCracken (Contractor)
Discussion: Proposed Forest Plan. Plan generally okay. East Pioneer Wilderness should not come down to the Forest boundary. Willing to volunteer use of his equipment to construct snowmaching trail between Comet Rigde and Elkhorn Road.

Contact: Tad Dale (Pfizer)
Discussion: Proposed Forest Plan. Expressed concern that minerals need to be given high priority when the Forest plans. Minerals occur where you find them. It is important to keep as much land as possible open for exploration and development.

Contact: (Ennis Open Door Session)
Attendees: Lynn Owens (McAllister), Gary Clark (Ennis),Earl Holt (Ennis), Chuck Aaberg (Ennis), Bob Lemard (Whitehall), Bob McDonald (Ennis), Sherry McDonald (Ennis), Jim Burt (Ennis), Bob Germann (Ennis), Bob Sitz (Pony).
Discussion: Proposed Forest Plan

Contact: Virgil Benson, Dean Fasnacht
Discussion: Mr. Benson and Mr. Fasnacht own a section of land adjacent to the Beaverhead National Forest (T7S, R2W, Sec. 35) in the Gravelly Planning Unit and were concerned about the management of the land, i.e. whether there were timber sales and subsequent roads, range management and wildlife considerations. They were particularly interested in the management of T8S, R2W since it contains important elk range and the seasonal closure of roads in the area. They were favorable toward the present management of the Forest.

Contact: Dillon Chamber of Commerce
Discussion: Proposed Forest Plan. Increased grazing fees; What increased grazing fees may mean to the agricultural base of the community.

Contact: Don Kambich (permittee)
Discussion: Don would like to see more sagebrush burned especially in areas which are well suited to livestock grazing. Avoid burning critical wildlife habitat areas. Don said that otherwise, for his area, current management direction is good.

Contact: Jim and Jules Marchesseau (Ranchers, permittees)
Discussion: Forest Plan. They are supportive of multiple use including livestock grazing and timber harvest if done properly.

Contact: Bill Wellborn (Rancher, permittee)
Discussion: Bill feels that the National Forest should be managed for the majority of the people to use and enjoy. He believes that roads such as up Buffalo and East Selway are good in opening more country up for people to use. Bill is concerned about too much area being put into wilderness which only a few can use and enjoy.

Contact: The Wilderness Society (Forest Supervisor and Planning Staff Officer attended meetings hosted by Tom Robinson and Peter Coppleman of the Wilderness Society.)
Discussion: The focus of the meetings was discussion of their 3 concerns about the Beaverhead Proposed Forest Plan. These are 1) Not enough wilderness recommended, 2) Inadequate consideration of and protection of soil and water resources, and 3) Improper timber values.

About 15-20 people attended the Butte meeting; mostly people who have already been involved in the planning process. Discussion in Butte focused on timber harvest levels and "subsidy" of timber industry, sediment potential, the "worst case analysis" concept, procedures for analyzing timber values, values associated with other resources and so on.

At the meeting in Missoula, about 25-30 people attended, including Cunningham who game a fairly detailed presentation on the wilderness options for the Forest. Questions were more general, some directed at Wagenfehr regarding opportunities for comment, economic analyses, and so on.

Contact: Joan Bird (Nature Conservancy)
Discussion: Discussed Nature Conservancy's comments on the Forest Plan. They will focus on the Research Natural Area Program, and on the efforts we make to recognize and protect threatened and endangered animal and plant species, with a focus on the latter. They have a list of plant species for us to be aware of. Nature Conservancy is also interested in working with us on land exchanges, conservation easements and so on.

Contact: Billy Stockton (Outfitter), Jim Zumbo (Editor at large for Outdoor Life), Suzanne Stockton, Perry Backus (Reporter, Dillon, Tribune)
Discussion: Discussed the Proposed Forest Plan and Stockton's concerns about impacts on opportunities for big bull quality hunting in the Big Hole. Reviewed the intent of the Forest Plan and the mitigation measures - everyone seemed to recognize that there would be little or no impacts on elk populations - but there would be impacts on opportunities to hunt in an unroaded, primative environment in certain areas and that "Big Bulls" would in some areas be more easily killed unless FWP changed regulations. Discussed Road Management. Zumbo expressed concern about the level of timber harvest proposed for the Big Hole Area and the amount of associated road construction.

Contact: Graeme McDougal
Discussion: Proposed Forest Plan. His primary area of interest is the Bloody Dick Drainage. "If I had my druthers, you'd have a lot more wilderness, but since I make my living as a logger, I have to be pro timber harvest. So I strongly encourage effective closure of roads to have the best of both worlds." Concerned that the FS hasn't been able to adequately maintain trails in places like Bear Creek, Trail Creek, and the rest of the Bloody Dick Country. If roads have to be built then they need to be effectively closed - physically barricaded. Not opposed to leaving the road open for a year to firewood cutters so the residue left in woods can be salvaged. But then, close the roads year around. Then roads could be used as a trail. FS doesn't need to build high standard roads.

Contact: Bridger-Teton (Carl Pence), Targhee (Paul Oakes) R-1 RO (Trevey, Robinson, Bozworth), Gallatin (John Sandmyre and Jim Devitt), Beaverhead (Susan Giannettino) - Yellowstone Coalition Coordination Mtg.
Discussion: The Yellowstone Ecosystem and our proposed management activities and objectives relative to it. Primarily an information exchange relative to the issues of primary concern to the Yellowstone Coalition; that is 1) Elk migration patterns, 2)Grizzly Bear, 3)Park Coordination, 4) Oil and Gas leasing.

Contact: M.L. Nielson
Discussion: Mr. Nielson called to express concern about the Forest Land Management Plan in relation to mining claims (Thorium) his company has in the Frying Pan area.

One of their representatives had been in Dillon last week and discussed their 1985 Operating Plan with Kathy Wilkerson. Kathy explained our Land Management planning process, and had given them a copy of the Forest Travel Plan. The Forest Travel Plan shows their area of concern as an "8" (area closed yearlong, designated routes open). He was specifically concerned about how such travel restrictions would affect their future minerals operations. We discussed intent of the restrictions, and how they could obtain access under the mining regulations by obtaining the needed operating plan. Their operating plan could specify the access they need, the season they need it, and they would work with Ranger District personnel to resolve any specific conflicts that were noted.

Contact: Mr. and Mrs. Bernard Harkness (Rancher, permittee)
Discussion: Opposed to expanding the Italian Peaks Wilderness Proposal further north to include the head of Meadow Creek. Expansion of the wilderness would be more costly to manage his allotment, especially distribution of salt. He was also concerned that it would not allow hunters into the area as easily to harvest elk, and it would conflict with future fire suppression activities. He felt that the proposed management direction for the area would maintain wilderness values involved without classification.

Contact: Mr. and Mrs. Bernard Harkness, Richard McNinch, Ernest Harkness, and Chuck Larson.
Discussion: (Continuation of discussion above) Possible expansion of the Italian Peaks Wilderness. Opposed any expansion of the wilderness as it would interfere with management of the allotment, maintenance of fences, distribution of salt, and would prohibit them from getting firewood from the Bear Creek area.

Contact: Nevin Stevenson, Billy Stockton, Tim Magness (Outfitters)
Discussion: Proposed Forest Plan. (This group represents the Beaverhead Outfitters in commenting on the Proposed Forest Plan.) They began the discussion asking for an extention on comments but feedback we gave them regarding continued discussion after the comment period closed disuaded them. We discussed Stockton's concept of "Big Bulls vx. logging -- which is more important". Generally, the group agreed that big bulls are going out, eventually, but they want to keep it from happening for as long as possible. While some members of the group indicated roads could be managed so as to reduce impacts on elk; Stockton indicated only a solution of "No Roads" would be adequate. All agreed there would be plenty of elk - but not of big bulls. Agreed that it would be possible to involve an outfitter in sale layout to try and avoid areas where elk congregate. Also agreed that sale layout would recognize camp locations of outfitter in the area to minimize impacts.

Contact: Pat Connell (Neville's Log Homes)
Discussion: Pat emphasized the interests of his company in deadwood on the Forest. His company feels that the Plan should address the impacts of firewood cutting on log home operations. It has not been recognized that there is a marketable, manageable product in deadwood. He also feels that watershed is a key interest. The hydrological impact of timber harvest in an area can be mitigated; the impact of a large fire cannot. He also felt that we should be concerned of a decreased timber offering on logging and logging related businesses that are already operating at "threshold" levels.

Contact: Logan Schendel (outfitter/guide)
Discussion: Mr. Schendel has operated a guide/outfitter business adjacent to the Wall Creek State Game Refuge for many years. He was concerned about the possibility

of Management Area 16, of T9S, R2W, someday being subject to a timber sale, since i has a timber allocation. He stressed that there is a historic major migratory elk route through the heart of the area and opposes cutting units or roads here. Areas of concern were Bobcat, Wall and Hyde Creeks.

Contact: Timber Industry (IFRC) - John A. Ulrich (F.H.Stoltze, Dillon), Dick Reid (IFRC), Michael Lyngholm (Stoltze Lumber), Mike Nichols (Stoltze-Conner Lumber), Royce Satterlee (F.H. Stoltze Land and Lumber), Bob Russell (Darby Lumber), Lee Converse (Darby Lumber)
Discussion: Timber industry's concerns about Forest Plan, the results of the public involvement, where the Forest now proceeds with the Plan. Industry pointed out the correlation of the public comments against roading in relation to the location of hard money roads put in during the last 5 years. Also pointed out the correlation between local leadership and responses. Asked that the Forest not talk about how good the sediment estimates, but document the strengths and weaknesses of the model. Emphasize that the figures are the "best estimates" and that the Forest will be doin monitoring to validate the estimates. Forest will change direction if impacts are greater than estimated. Industry is concerned that over 500,000 acres of commercial timberland has "disappeared" into other uses since planning began. Representatives said that the yield tables are "reasonable." They also said that they realized that the Forest has 3 timber bases: a biological base, an economic base, and a political base. However, they are concerned that with all Forest plans reducing the amount of timber to be offerred, some timber mills would be forced out of business. The Darby mill estimates they need 25 MMBF per year, and Stoltze needs 20-21 MMBF per year. They suggested that the Forest do a FORPLAN run that established a "floor" of what is needed by timber industry and determine how much more roadless country will be impacted by the resulting harvest. By maintaining a large timber base, management could be less concentrated and mitigation measures could be increased.

Timber industry representatives also pointed out that costs have changed dramatically in the past few years since the 1982 draft; costs have come down rather than gone up.

Industry representatives were told that it would be impossible for the Forest to produce the amount of timber they were asking for, and, at the same time, to provide for demands being placed on the other resources in the Forest. The Forest agreed that we needed to look at the interaction between Forests, because all of the area Forests seem to be reducing harvest levels. The Beaverhead is not "locked into anything," and will consider the comments made by the timber industry as the Final Plan is written.

In addition, the Forest and industry need to have a better partnership with Montana Fish, Wildlife, and Parks and other agencies. "All the security cover in the world won't be effective if elk are driven out onto the flat the first week of December to be shot."

Contact: Anaconda Sportsmen
Discussion: The Wisdom 10 year program and the Forest Plan as it related to the Wisdom timber sale program. The Wisdom District presented information about the 10 year program and also information about sales under contract but controversial. The discussion related to Forest planning focused on road construction and road management. Concern about high standard roads...the Howell Creek road was cited as too high a standard. Concern about road management; again support here for timber harvest but only with effective road closures and very low standard roads and long periods between entries. Several members said there was all the access needed in the

Big Hole right now...that generated a discussion of right of way...they recognize that problem. Said in the east side of the Big Hole, Steel Creek, Doolittle, and Warm Springs provided all the needed public access. Any additional roads should be built to the very lowest standard possible and closed to all uses after the sale year round. One participant expressed concern with sage brush burning. District personnel discussed it with him and suggested a field trip and even his and group's participation in a burn.

Contact: Bob Anderson (Greater Yellowstone Coalition).
Discussion: Discussed the Proposed Forest Plan, with primary focus on the Madison Valley. Anderson indicated the area south of Ennis as of interest to his group. Discussed the history of timber activity in the Madison; discussed other resources also. Emphasis of discussion was on wildlife and fisheries resources. Discussed our responsiveness regarding Trumpeter Swans. Discussed comments we were getting from other organizations, including the work Cunningham is doing on management area direction for the Snowcrest. Anderson discussed timber sale economics, clearly from the perspective of O'Toole's paper. Debated the concepts of short-term timber sale economics versus Forest Plan economics. Anderson presented the views of those people who see the Beaverhead as a good "test Forest" regarding timber suitability.

Contact: Beaverhead County Commissioners
Discussion: Comments from Jackson and Wisdom meetings, road construction, protection of elk habitat, management of grazing programs and timber harvest levels. The only people they had heard from was timber industry regarding the Plan. Asked about the way we would manage oil and gas leasing - how would we maintain control of what was going on. When would we address/control field development? Also asked how receipts to counties worked with oil and gas development.

Contact: Bill Henson (Miner)
Discussion: Wants boundary of E. Pioneers Wilderness moved north of Cat Creek to avoid his mining claims.

Contact: Bill Hill (Recreation Director, Anaconda, Montana)
Discussion: Proposed Forest Plan. Wanted copy of overview.

Contact: Butte Open Door Session.
Attendees signing the register were: W.J. Montgomery, Tom Ryan, Jim Thompson, Earl A. Jaamison, Sandy Richle, C.Thompson, Ralph Bugni, Tom Piercy, (Skyline Sportsmen), Bob Griffin, Dale Miller, Miles Moquist (Anaconda Sportsmen), Diana Clark, Bill Clark, Dick Solum (Silver Bow Archers and Skyline Sportsmen), Dan Carter (Montana Standard), Fred Malesich, Dana Malesich, Tom Carroll (Silver Bow Archers), Elaine Howard, Barb Beck, Rich Prodgers, Jeanette Prodgers, Wes Mullaney, John S. Miller (Trout Unlimited), Daniel Dolan, Robert E. Bishop (Val-Desta Mines and Minerals), Ronald J. Glovan, Talley Hayden, Phil Paull, Tim Sullivan, John E. Lovell (Squaw Creek Hunting Club), John H. Lovell, Doug Hubbard, Andrew Kuchtyn, Dale Garrison,
Discussion: Forest Plan discussion, open-structured.

Contact: Beaverhead Planning Board.
Members are: Ken Krause (Jackson); Byron Martinell (Dell); Bill O'Connor (Dillon); W. Gilbert (Dillon); Dan Cardita (Dillon); Jim Wilson (Dillon); Ralph Stosich (Lima); Leonard Hansen (Dillon); Dale Pettit (Wisdom); Jim McIssac (Dillon); Holly Smith (Glen).
Discussion: (The following questions were raised in discussion of the Forest Plan.) How can you assume that you can do all the things you say you are going to do and not

adversely impact fisheries? What are the impacts going to be on the rancher? Wh does the Forest Service need to get all this access? Seems quite excessive, especially in the Pioneers. What are the changes in this proposal from 1982? Is Forest Service influencing the proposed land exchanges that BLM is doing in the Centennial specifically since it looks like the FS will acquire the BLM lands in th area? How will the BLM and FS plans be fit together? How much did the DEIS cost print?

Contact: Beaverhead County Planning Board-Natural Resources
Discussion: Proposed Forest Plan. Focused on the additional access needs identifi in the Supplement. The information about the rationale underlying the access acquisition proposals from Wise River were seen as very useful and similiar information was requested for Lima area. The argument presented was that adequate access could be provided with a road every 8 to 10 miles instead of every 3-5. Als concern was raised regarding our ability to manage the public access routes once we acquire them. Smith pointed out that once the public perceives the road as public, i.e. "theirs" the tendency was to abuse it. Concern was also expressed about the impacts of public abuse of the adjacent public lands, near the right-of-way. There is not enough money to police the rights of way according to the Planning Board. They also wanted to know about historical use and the precedent set by historic uses. Other discussion focused on opposition to the wilderness proposals. Also, t timber harvest levels and water storage on the Forest.

Contact: Beaverhead Outfitters and Guides
Discussion: Proposed Forest Plan. Questions asked: limitations to or prohibition of stocking of fish in high mountain lakes. Impacts of the Forest Plan on big bull elk. Plans for road construction and management.

Some questions related to snowmobile traffic in the Gravellys on the Madison Distric during hunting season. Complaints about use of red flagging in areas heavily huntec misleads people into thinking a hunter or animal (cow or horse) draped in flagging in vicinity. Questions of allocation in Lolo Mesa area.

Contact: Chuck Ruzicka (Sheridan SCS)
Discussion: Ruzicka supports "Alternative W - As much wilderness as we can get!"

Contact: Sheridan Snowmobile Club (Vern Doornbos)
Discussion: Proposed Forest Plan.

Contact: Joe Helle
Discussion: Proposed Forest Plan in relation to livestock grazing.

Contact: George Swan
Discussion: Discussed the Grazing allocations. He seemed to feel comfortable with the Plan at that time but hadn't had a chance to really review the entire package.

Contact: Dana Cole, Canyon Creek Ranch
Discussion: Proposed Forest Plan.

Contact: Don Shaffner (Grazing Permittee)
Discussion: Proposed Forest Plan. Don expressed concern about the continual encroachment of wildlife use of the forage resource. Ranchers put their allotments under management which increases forage production, and wildlife seemed to get the increase not the livestock. Since the livestock person improved the range, they

should derive the benefit. It is important to keep wildlife numbers within reason and in balance.

Don said he wants to be more involved in the management of his range and asked to be invited whenever we are doing any surveys or studies. He wants to better understand his range's potential and how to manage it.

Contact: Fernando Blackgoat (Exxon Oil Company)
Discussion: Montana Wilderness Study Act proposal versus what is being recommended for wilderness in the Proposed Forest Plan. Current wilderness legislation. Mr. Blackgoat is against increased wilderness, especially the Italian Peaks area due to the vast oil and gas potential. Another concern shared by Mr. Blackgoat was our displaying an "insignificant decrease in trout numbers" over time in the Revised DEIS (summary pages 6 & 7).

Contact: Bob Flynn
Discussion: Mr. Flynn was very concerned about the damage that dirt bikes were doing in the East Pioneers, especially on the trails to the lakes. He supports a wilderness designation for the East Pioneers and the West Big Hole proposed wildernesses (A1-008 and I1-945). He has backpacked alot and is "sick and tired of all the high power motorcycles, noise and damage to these areas."

Contact: The following persons were contacted by personal note from the Wise River District Ranger, inviting them to the Wise River Open Door Session to be held February 19, 1985: Jerry Mallon, Lowell Mallon, Robert Schonsburg, Sr. (President, Wise River Snowmobile Club); Dean Stanchfield, Don Jones, Wallace Christensen, Ernie Bacon, Charlie Ralston, Phil Ralston, Willie Ralston, Charles Hahnkamp, Rich Franko, Merle Edsel, Mac Carrelli, Don Verbance, John Peck (Ranchers); Neils Anderson, Ron Primozic, Jim Easley, Lee Kirkpatrick, (Landowners); Frank Stanchfield (Rancher, River Outfitter); Jim Gnose (Store Owner); Hershel Welles (Trapper, Landownner Bar Operator); Dave Decker (River Outfitter); Skip Mathewson, Gene Spolar, (Sportsmen); DALE COMBS (Sportsman and Guide), LES DAVIS (Owner of Sundance Lodge), Bill Stockton (Outfitter), Ron Russell (Range Rider).

Contact: Foster Howland (Hecla Mining Company).
Discussion: Mr. Howland was interested in what the management prescriptions were for the areas his company had mining interests. The area in question was T11S R13W sec. 10,15,16,22. The MA's for the area in question are 1 and 22 in the Proposed Plan. He was referred to the Forest Geologist for further information on standards.

Contact: Jerry and Fred Rutledge
Discussion: Informed of District Open Door sessions and requested their attendance and participation in Proposed Forest Plan review.

Contact: J.B. Anderson (Rancher)
Discussion: Requested Anderson's participation in Jackson or Wisdom Open Door session.

Contact: Jack Hirschy (Rancher)
Discussion: Informed Jack of open door sessions in Jackson and Wisdom. Requested attendance and participation in the sessions.

Contact: Jackson Open Door Session
Attendance: Dolores Husted (Montanans for the Protection of the Big Hole), Kerry Sparks, Jay Nelson, Tom Furnandiz, Harold & Margie Peterson, Marvin Furnandiz, Martin Jackson, Jack Hirschy, J.B. Anderson, Claudia Hutcheson, Anne Verbance, Bob Nelson
Discussion: Presentation of Forest Plan. Answered questions from attendees.

Contact: John Atkins (Miner)
Discussion: Wants boundary of E. Pioneers Wilderness moved north of Cat Creek to exclude his claims.

Contacts: John Young
Discussion: Discussed the purpose of the public open door sessions and the need for public input. He is concerned about road construction in general and whether or not the public would be able to use those roads.

Contact: Kerry Sparks
Discussion: The purpose and need for public involvement. How public input is used. Road closures.

Contact: Mr. and Mrs. Lawrence Christiansen (Ranchers)
Discussion: The Christiansens brought a copy of Randy OToole's report completed under contract for Jim Welch and wanted to know how much weight this report would have on our decision to manage the North Big Hole. Christiansens were assured that we would consider O'Toole's report as any other comment submitted. The Christiansens emphasized that there are other values to be gained by harvesting the North Big Hole (eg. recreation access) than just the timber values. They are concerned that if we do not log the North Big Hole the fuel levels will continue to build up (especially after the bark beetle hits) creating a devastating wildlife situation.

Contact: Leonard Hanson
Discussion: Discussed the Forest Plan as it pertains to his grazing allotment. Indicated the intent of Forest planning was to provide Forest wide direction, and that grazing programs would not be changing. Also indicated that there might be some changes in the ways his allotment would be managed as allotment management plans are implemented to meet Forest Plan standards.

Contact: Madison County Commissioners
Discussion: Forest Plan presentation. Discussed timber harvest level, management of the grazing program, noxious weeds, impacts of the additional access on private lands when people leave the FS and go onto private, cattle trails and why we don't have more of these, range betterment fund distribution, road maintenance, and wilderness.
Contact: Mariner Ballard (Rancher)
Discussion: Explained the Forest planning effort and the need for public participation. Also talked about issues.

Contact: Max Lapham
Discussion: Talked about Forest planning in general. Max is upset about all the roads proposed to be built - some into very important elk security areas. Also talked about "below cost timber sales." He found the Forest Plan very hard to understand. He knew people who were opposed to extensive roading.

Contact: Meadow Creek Stock Association
Attendance: Bob Germann, Randy McGuiness, Ray Easter, Dave Skank, Larry Hughes
Discussion: Discussed Forest Plan as it relates to range management.

Contact: Don Aldrich, Bill Cunningham, Tamzin Brown, Jack Tuholske, Chris Kronberg, Don Essig, Tom France, Hank Fischer, Chadeayne Rouch, Jim Curtis
Discussion: Formal Forest Plan presentation. Elk--discussion led by Cunningham of the model used wherein a closed road is assumed to provide as much security as no road. Discussion of the errors of this, esp. given the problems of enforcement although we pointed out improvements in enforcement and that there does not have to be 100 percent compliance for the closure to contribute to security. Discussed effectiveness of closure devices. Wilderness--Cunningham presented the perspectives of the Wildlands Coalition of our proposal. Some comments on the inadequacy of the Salmon's proposal. Roadless--discussion of the specifics of the "blueprint" the local groups from Butte are working up...Cunningham wanted to know how receptive we would be to some specific changes, including about 50,000 acres pulled out of the timber base in order to protect some sensitive drainages. We said the more specifics we could get the better. Oil and gas--questions about how the decisions on leasing on the Flathead and Gallatin affected our leasing situation? Concern about enforcement of stipulations given the examples set by the L and C. Concern that we not reissue leases or issue any new ones without doing more thorough analysis as Hatfield indicated the two Forests in the lawsuits needed to do. Fischer suggests we defer issuance in roadless areas we want to protect. Below cost sales--discussion of sensitivity analyses. Discussion of costs and values and which set at what time would be preferred. What analysis is more accurate--local or Forest wide? I said depended on what you wanted to know. Discussion of suitability and ground truthing, related esp. to ground truthing of stands in timber base that are weeded out due to economics. Fisheries and water quality--questions regarding validity of data and models. Reliability? Monitoring discussed. Range--questioned our ability to manage ranchers, and our committment to implementing the allotment management plans. Concern that we could not get the funds to do the range improvements we said we would do and that the AUM's would still not change.

Contact: Montana Outfitters and Guides Association (Approximately 25-30 people were in attendance.)
Discussion: Forest was asked to give a brief presentation on the Forest Plan. A presentation was also given by the Montana Department of Fish, Wildlife, and Parks. Joel Peterson and Mike Frisina gave presentation about the wildlife standards we had proposed in the Forest Plan. Generally, they were very positive about the standards concerns they raised, focused on specific area allocations; the 70% effective cover ratio and the amount of road closures that could occur if too much timber harvest is done. Also, discussed concern about need for monitoring. Also expressed concern that, "while there will be plenty of elk" there will be fewer big bulls, especially in the Big Hole. Max Lapham asked if there would be hunting in the future in the Pioneers. Answer - sure, but will not be as we have knownit; seasons will change, permits will be needed. Generally, the presentations by Peterson and Frisina were positive. Giannettino briefly talked about monitoring, comments, committment of F.S. to Forest plans: Funding; need for expression of opinions, etc. Dick Oswald gave presentation on the fisheries portion of the Forest Plan that was very negative. In general, he covered the Department's comments on the Forest Plan regarding water quality and fisheries. A lot of his critique was philosophical and not specific with suggestions; rather he wanted what is not possible. Quite a bit of discussion regarding the economic values of fishing and hunting, both that incorporated in the Forest Plan and that expressed through other studies and

analyses. Argued that Forest planning seriously under estimates value of fisheries/hunting activities on Forest. Oswald had serious question for sediment estimate used in calculating fisheries impacts - said we assumed 45 parts/million sediment before negative impacts occurred. Said that was way too high (check Lloyd). Presentation was made by Al Luebeck on timber sale program and timber sale economics. Used a lot of information (numbers) that were incorrect but general concepts were correct. Referenced both O'Toole and Grove report. During question and answer period, Giannettino talked about edonomic analysis and the need to understand the assumptions underlying the analysis. Also talked about the need for site specific comments.

Contact: Skyline Sportsmen, Anaconda Sportsmen, BFCC (Dick Solum, Chris Merchion, Tony Schoonen)
Discussion: Discussed fisheries and water quality impacts (especially the need for further study and analysis of individual drainages regarding water quality), concerns about road construction including appropriate standards, concerns about timber harvest, interest in the standards we are using for elk security, monitoring ("how do we know you will do what you say you are doing"), concerns about below cost sales; concerns about targets driving the Plan whatever the standards are. We indicated that we can listen and try to respond to site specific suggestions they might have regarding the areas they want to see remain unroaded. Also discussed the perspective that timber harvest can be ok; it's the change in access to an area that they oppose; so if roads are built to the lowest possible standard and never open to public use and truely effectively closed--that may meet some of their concerns.

Contact: Lawrence Christiansen (Rancher)
Discussion: Management of the North Big Hole aera, specifically the area behind the old Albee Ranch. Reviewed the allocation map and projected 1988 timber sale in Howell Creek. Christiansen agrees with our proposal. I made sure we discussed the timber MA's, custodial management and wildlife management areas in the area of interest. He is in favor of cutting timber and is not opposed to clearcuts if they are not too large.

Contact: Tom Robinson
Discussion: Forest Plan. He indicated concern about the amount of roadless country on the Beaverhead and the desires of the Wilderness Society to get as much protected from development as possible. We discussed below cost sales and the reasons for them being below cost. Discussed fisheries and water quality and the potential study of the Big Hole that Baucus is thinking of. Discussed some allocations that would be nonwilderness but no development in this round of planning.

Contact: Contacted the following permittees to inform of open door sessions and request involvement: Tom Clemow--Jackson, Welch Ranch, Pete Peterson (Foreman)--Wisdom, Dick Hirschy, Mrs. Hirschy--Jackson, Hiram Lapham --Jackson, Russell Peterson (kids - personal visit)--Wisdom, Ed Bacon--Wisdom, Ray Bacon--Wise River, Ray Burrows & son Lee--Wisdom, Martin Jackson--Jackson, Clayton Huntley--Wisdom, Jock Mcdowell--through Wisdom Snowmobile Club, Lester Else--Wisdom, John Husted--Jackson, Harold Peterson--Jackson.

Contact: Pintler Audubon meeting
Attendance: Stephen C. Morehouse, Don R. Stoecker, Jim Schaeffer, Ted R. Carlson, Kalmar R. Stevenson, Peggy Holmes, Jim Roscoe, Kevin B. Elliott
Discussion: Sherry Milburn and Mike Rath gave formal Forest Plan presentation. Then opened the floor for discussion. Members expressed concerns for maintaining

ersity for game and nongame wildlife species. There was particular interest in
the Forest would maintain habitat for cavity nesters and old-growth dependent
cies and how these species would be considered in the timber program. One member
concerned that adjacent timber cutting units should not be cut until there is
ficient hiding cover for elk or other big game species. Mike Rath explained how
es would be laid out in time and in geographic space to address these questions.
bers are concerned about the number of miles of road. One member said that he
ught that all roads should be closed (put back to the natural state) when timber
vest is finished in an area. Most expressed agreement with the Forest's policy of
sing 75% of the new roads, at least during hunting season and during elk calving.
e emphasized that we will not be managing for old growth in the areas allocated to
ber harvest. However, there will be old growth outside of the timber allocated
as. Members wanted to know how their comments would be considered and how they
ld be responded to. Sherry gave a brief explanation of how the Forest routes the
ments, who reads them, how they are summarized for use by the decision makers, and
we are "tentatively" thinking about responding to each comment.

tact: Robert Schonsburg, Sr., President of Wise River Jack Pine Savages
wmobile Club
cussion: Forest Plan. Offerred to put on presentation for club at regular
ting.

tact: Ray and Shawn Stoll (Ranchers)
cussion: Ray and Shawn are concerned that there are an excessive amount of roads
clearcuts in the area of his ranch and that they are concerned with the effects
additional excessive clearcutting on the water quality of the area, on the elk,
on the quality of the environment in general. Believes we should go very slowly
h the timber harvesting program so we don't make the same mistakes we have in the
t. He is not opposed to timber harvest, but thinks we are proposing too much of
..we are learning at the expense of the country. He is also concerned that we are
t selling timber to the big operators; the small gypos can't buy anything and
lze has the country sewn up. Would like to see us sell timber when there is a
d for it and not sell when there is no need. Specifically wants us to stay out of
country near Lemhi Pass, above Kelly Creek as that is important elk security
a. Also wants us out of parts of Bloody Dick Creek drainage--Goldstone, Eunice,
ty Creeks in particular. Finally, expressed frustration about ability to get dust
ling on the road by his place...with dust stirred up from Stoltze hauling.

tact: Richard Rice, Wilderness Society, Washington, D.C
cussion: Timber prices and values we used in FORPLAN. Current timber prices we
getting on the Beaverhead. New analysis with respect to new changes in Adams and
nes projections.

tact: Dillon Rotary
cussion: Forest Plan presentation. The presentation was brief and general and
estions few. One question on how this tied into the other studies of wilderness
at have been conducted over time. A question was asked about the Job Corps and
at is happening there.

Helle brought up the revised LMP during the meeting. He wanted to know why we
revised the 1982 Draft when it appeared that all we were doing was re-studying
RARE II areas again. He was concerned that we were going to propose more
lderness. He feels that we have more than enough wilderness now, and cannot afford
re wilderness or more studies designed to create more wilderness. We explained the

best copy available

Ninth Circuit Court situation with those present. George Swan, another rancher present, expressed similar sentiment, and emphasized the need to get on with "multiple-use".

Both Joe and George indicated the Plan sounded satisfactory to them in proposing about the current level of grazing, although they both felt that grazing levels could be increased on several allotments. They realized that we had to consider other interests than just grazing, but that they hate to see grazing take a hind seat when important decisions are being made. George was quite emphatic that the FS should be much more aggressive in helping to counter some of the "anti-grazing propaganda" being publicized by preservation interests, especially since most of it is based strictly on emotionalism and not on fact.

Joe is also very concerned about predator control. He feels that the sheep industry has enough problems without having uncontrolled sheep losses to predators. He wants to see all approved means available to US Fish and Wildlife Service Animal Damage Control agents for predator control on and adjacent to sheep ranges and crossing areas on the Beaverhead. He anticipates additional very serious conflicts as T&E species populations increase and the animals extended ranges. He is especially concerned about grizzly bears and grey wolves.

Contact: Butte Skyline Sportsmen
Attendance: FS-Pence, Stellingwerf, Giannettino; BLM-Cosgriffe; FWP-Frisinia, Lonner; Members-about 25, including Dick Solum, Tim Sullivan, Tony Schoonen, Al Lubeck. Discussion: Forest Plan. Focused the discussion on the fisheries, wildlife and water quality aspects of the Forest Plan and the other resource outputs that could affect these resources.

Following Lonner's presentation on the elk study in the Gravellies, we got into some discussion of the security cover impacts the Forest Service's timber harvest and road construction program were having. Other questions had to do with the timber harvest level. Questions about the degree to which we would close roads yet still harvest timber in the effort to maintain 70 percent effective cover. Discussion of below cost sales.

There was quite a discussion of the need for negotiation and discussion. Talked about generating specific comments; about the importance of responding and being involved; and so on.

Contact: Tom Clemow, Sr. and Tom Clemow, Jr. (Permittees)
Discussion: Expressed some concern for our activities in Warm Springs area as regards roads. Felt some roads were good from a standpoint of improving access for range management but were bad when they provide so much additional access to general publics. Provided a copy of the "overview" and requested their involvement and attendance at Jackson open house.

Contact: Telephone conversation with Wayne Ludeman (IFRC)
Wayne wanted the timber programmed sale data for decades 2 and 4 for the Proposed, High Timber, and Low Timber alternatives. Gave him the information from the monster matrix worksheets.

Contact: W.M. Trover (geologist)
Discussion: Mr. Trover wanted to check on some mining claims (patented and unpatented) in the Elkhorn area. Some of the unpatented claims he is concerned about

are within the boundary of the East Pioneers Proposed Wilderness just east and northeast of the Elkhorn area. He expressed concern that the Forest Service should take into consideration the mining potential of all areas before wilderness proposals are drawn up. He said that it was "weakening our country" when we lock up areas with mineral potential in wilderness. However, he did say that the areas that were unpatented in the East Pioneers in which his company had expressed interest were probably not worth mining at this time. He did not want to make written comment at this time.

Contact: West Fork Stock Association.
Attendance: Frank Shaw, Vern Shaw, Sonny Huckaba, Chet Jones, Pierre Sonderer, Miles Bobb.
Discussion: Proposed Forest Plan.

Contact: Western Environmental Trade Association
Attendees: Marcone, Kington, McBride, Swift, Ulrick, Blasing, Ludeman, Nina Smith, Representatives of Brand S, Montana Snowmobile Assoc., and Dave Hammond, a rancher.
Discussion: Formal Forest Plan presentation. Questions: Why are you so specifically addressing water quality? Do you feel you will violate Statestandards? What is this security cover thing all about? Is this just a judgement of what quality hunting is? Is the tradeoff in timber volume worth it? Where did all the suitable land go since the 1982 DEIS? You have lost 100,000 acres, some of which is difficult to track? Why aren't you displaying the impacts the new and old utilizations standards have? What flexibility are you leaving yourselves in the event of a mountain pine beetle infestation? What are the dollar tradoffs associated with elk? Why don't you compare elk AUM's to cattle AUM's? Why don't you put the tentatively suitable on the suitable graph display? Hammond and Ulrick are very concerned about timber volumes and the adverse impacts on their mills. Ulrick was concerned that we might have assumed 100 MMBF of uncut but sold volume in our determination of first decade harvest. Also, he dislikes our rationale regarding the Madison harvest.

Contact: Willow Creek Stock Association
Attendance: Homer Maichel, Bill Jackson, Ward Jackson, Calvin Smith, Bob Edwards.
Discussion: Proposed Forest Plan

Contact: Wisdom Volunteer Fire Department
Attendance: Mel Heggelund, Rich Lawson, Rex Caraker, John Wilke, Bob Wilke, Larry Tucker
Discussion: Presented issues -- wilderness, water quality, timber/wildlife, below cost sales and requested comment whether supportive or opposition. Invited attendance at open door sessions or visits to office to review Plan and discuss issues. Presented Forest allocation map. Frustrated that planning never ends. They would like to be able to use snowmobiles in wilderness. Frustrated in lack of enforcement of area restrictions to protect wilderness - non-local influence in decisions.

Contact: Wisdom Open Door Session
Attendance: Tom Nelson, Dan Stevenson, Hack Hirschy, Ray Thomas, George Thomas, Norman E. Foscher, Larry Tucker, Charley E. Wissenbach, Shirley Chan, Cheryl Martin, Wallace Christiansen (Cattle Co.) Bob & John Wilke (Wilke Brothers Sawmill) Monte Clemow, Mark Clemow, Rich Lawson, Rex Caraker, Mike Paddock, (Paddock Logging) Lester

Else, Richard Gross, Ray Bacon, Bill Jonas (Darby Lumber, Inc.) Daryll Jacobson (Big Hole Snowmobile Club)
Discussion: Proposed Forest Plan presentations and questions.

Contact Wisdom Snowmobile Club
Attendance: Rich Lawson, Rex Caraker, Larry Christianson, Jock & Kathy McDowell, Tom & Darlene Furnandiz, Mark & Sherry Raymond, Jan Anderson, Mike Pettit, Heidi Hirschy
Discussion: Display Forest Plan map and presented wilderness, watershed, timber/wildlife, below cost issues. Requested involvement, comment, attendance at open door sessions, or visits to office. Concerns expressed: 1) Construct roads and then close them, 2) Frustration in constant planning, 3) Wilderness vs. snowmobiling, 4) "Outsiders" carry all the influence, 5) Timber needs to be managed, 6) Large clearcuts are no good, and 7) Good logging practices are of real benefit to elk.

Club generally supportive of Plan but takes serious issue with wilderness. Does not need to formally classify as wilderness when nature of country precludes development. Designation of West Big Hole as wilderness will create serious enforcement problem.

Contact: Alan Zetler
Discussion: Expressed concern about the Thief Creek timber sale (1990). Was more concerned about roading in the area than the cutting units. Was generally very agreeable about the Plan and especially favorable about D1-008 being designated wilderness in the 1984 DEIS. Was interested in the amount of development planned for the southwest border of the Tobacco Roots, but upon review was agreeable with Forest Service management of the area.

III. Selected Issues, Concerns and Opportunities

Following is a discussion of the major issues, concerns and opportunities (ICO's) that are the focus of the Beaverhead Forest Plan and EIS. A detailed discussion of the present situation for each of these is given in Chapter III. More discussion of how the ICO's are differently treated in each alternative is provided in Chapter II, Chapter IV and Appendix B.

Each of the 7 major ICO's will be discussed in three parts: 1) public perception of the ICO's and rationale, 2) possible interrelationship between resources and other ICO's, and 3) how the ICO will be addressed in the alternatives, including the Forest's potential capability to respond.

ICO 1: How much of the forage produced on the Beaverhead National Forest should be used by domestic livestock? What constraints should be applied to the domestic use of forage?

Rationale

Livestock grazing has always been a significant activity on the Forest. Presently, 216 permittees graze approximately 66,000 head of sheep and cattle on 174 separate grazing allotments.

People involved in livestock operations and related businesses are concerned that livestock use not be reduced and if possible should be increased. Others interested in water, fish and wildlife do not want adverse affects to these resources resulting from grazing. Increased demands for wildlife and livestock can be anticipated.

Resource Relationships

Grazing practices have the potential to affect watershed condition, water quality, fisheries, and riparian zones and grazing wildlife, especially elk. This ICO may be, at times, in conflict with ICO 4 concerning wildlife habitat. There is also potential for competition between livestock and wildlife for forage.

Procedure to Address

Although the acreage assignments of permanent rangeland available for livestock grazing do not change by alternative, the acreage of different intensities of range management vary with the intent of the alternatives. In addition, transitory forage made available through timber harvest varies by alternative and by decade within each alternative. The range of animal unit months (AUM's) varies from current level to levels that could meet anticipated demand. Since wildlife and livestock can compete for the range forage resource, the emphasis placed on each group's needs depends, in part, on the emphasis of each alternative.

Standards to coordinate livestock grazing activities with other resource values are in all management prescriptions that include grazing activities. Utilization standards are set by the management prescription to assure adequate forage for domestic livestock and wildlife and adequate biomass to maintain plant vigor. These utilization standards do not vary by alternative.

ICO 2: What areas should be managed for a continuous supply of timber products? When and where should timber harvests be scheduled?

Rationale

Approximately forty percent of the Beaverhead National Forest is available for and capable of producing commercial timber (at least 20 cubic feet of wood fiber per year). These lands are dominated by lodgepole pine stands. Englemann spruce is often found on wet sites and Douglas-fir in the transition zone between grasslands and forested areas. Subalpine fir, whitebark pine, limber pine and alpine larch are found in lesser amounts.

A large proportion of the Beaverhead timber resource is over 100 years old and has a high incidence of insect (mountain pine beetle and spruce budworm) and disease (primarily dwarf mistletoe). A mountain pine beetle epidemic, of major size and resource impacts, is occurring in the Madison Valley.

Local mill capacity cannot be satisfied nor can the mill be expected to remain in competitive business without fiber from National Forest lands. Mill managers have presented concerns that the costs associated with hauling timber from other parts of the State are prohibitive, especially when considering current and projected market conditions. The jobs provided by employment at the mill has a significant effect on local economy.

Resource Relationships

The short-term economics of timber harvest are low due to the existing stand conditions on much of the Forest. Merchantable stands are often scattered throughout a mosaic of open parklands and patches of hardwood species increasing the amount of road necessary for harvest. Past mountain pine beetle infestations, shallow soils and/or overstocking has resulted in low existing volumes per acre. Average volume in lodgepole pine stands is 6 to 9 MBF per acre. Under management these stands could produce from 12 to 15 MBF in an 80 to 100 year rotation, but the initial investment in roads and cultural treatments is high.

The timber/wildlife relationship has elicited much public interest in Beaverhead National Forest management. The security and thermal cover provided is of key importance in maintaining big game populations. In open areas, such as the Gravelly Range, the timber stands have a special significance in the protection provided during the hunting season. Consequently, this resolution of this issue has the potential to influence the Forest's ability to respond to ICO 4.

A substantial portion of the Forest's timber is contained within the boundaries of the Forest's inventoried roadless lands. In these inventoried areas, management alternatives may have an influence on roadless recreational uses and opportunities and continued potential for wilderness/roadless consideration. Thus, resolution of the timber issue may be in conflict with resolution of ICO's 3 and 7.

Timber harvest also has the potential to affect ICO 1, in that harvest may create transitory range that could be used for grazing of domestic livestock. Harvest may also create some adverse impacts by removing natural barriers to livestock movement. Fences may have to be built, increasing costs for permittees and/or contractors.

Procedure to Address

Suitable timberland acres (land on which timber harvest is scheduled over the 15-year planning horizon) differ in each alternative, ranging from 313,100 acres in Alternative D to 652,500 acres in Alternative B. Additionally, intensities of timber management vary with the intent of the alternative.

Standards to coordinate timber harvest activities with other resource values are covered in the Forestwide Standards and in all prescriptions that allow timber management.

ICO 3: To what degree should the various recreation opportunities be made available for public use?

Rationale

The Beaverhead is characterized by abundant, high quality outdoor recreation opportunities. Attractions include a relatively primitive land character (with low population density, and relatively light use), an abundance of fish and wildlife, lakes and streams, and rugged, high elevation lands.

There is public interest in and opportunity for the Forest to provide, areas classified as "scenic" or "special," where visual quality and recreation uses are highly valued. Overall, demand for recreation opportunities, both in number and variety of activities, is expected to increase.

Resource Relationships

A recreational opportunity inventory of Forest lands indicates significant opportunities exist for lightly developed, primitive and semi-primitive forms of recreation and moderate opportunities for more developed recreation pursuits. For most activities, the problem is not quantity, but rather the location of these areas and the quality for the intended use.

Limited access to and within the Forest presents challenges in recreation management. Much of the Forest is bordered by private land which results in having travel funnelled through relatively few access points. Additionally, approximately 58 percent of the National Forest land (excluding designated wilderness) is unroaded, limiting the amount of the Forest that can be enjoyed by motorized-vehicle users. Those who enjoy more primitive recreation experiences are also somewhat impacted by limited access. Some of these users have expressed concerns that the lack of access through private land to the Forest boundary has excluded their use of the more remote parts of the Forest.

Conflicts arise when development-oriented management activities, such as timber harvest, are scheduled where recreation use has traditionally been primitive or semi-primitive, nonmotorized. Therefore, this ICO may be in opposition to ICO 2.

Conflicts also arise when different types of users (horse users, hikers and backpackers, and motorized vehicle operators) compete for use of specific areas. In addition, motorized use, particularly off-road vehicle and motorbike use, has the potential to cause resource damage to sensitive areas. However, most of these impacts are mitigated through enforcement of the Forest Travel Plan.

Resolution of ICO 7 (wilderness) with a high level of wilderness designation will impact opportunities for Forest users who enjoy off-road vehicle or motorbike use of unroaded areas.

Procedure to Address

The number of recreation visitor days, as a whole, exceed present and future anticipated demand. However, as developmental activities take place in previously unroaded areas, the Forest expects that there will be a "shift" in the kinds of users in those areas. The amount and extent of developmental activities will be directly related to the intent of the alternative.

Alternatives are monitored to determine the effects on the different types of recreation uses (motorized versus nonmotorized). Additionally, alternatives are designed to provide more or fewer primitive and semi-primitive recreation as a direct benefit of the amount of recommended wilderness (ICO 7).

Forestwide Standards and Management Area Standards coordinate recreation uses with other resource values to the extent possible.

ICO 4: What actions are necessary to provide wildlife habitat to meet elk and fish targets established in cooperation with the Montana Department of Fish, Wildlife, and Parks?

Rationale

The Beaverhead National Forest provides habitat for approximately 385 species of wildlife and fish. Most of these are managed by providing habitat through constraints on other activities, i.e. grazing, timber harvest, mining. Through coordination with the Montana Department of Fish, Wildlife, and Parks, target populations have been established for elk and trout.

Elk are considered the major game species on the Beaverhead National Forest. A majority of the summer range and about one-third of the winter range for current populations is on National Forest lands. Much of the calving and most of the hunting occur in the National Forest. The Montana Department of Fish, Wildlife, and Parks, hunters, and recreationists interested in wildlife are concerned that Forest Service management practices provide adequate winter and summer forage, proper protection of calving areas and adequate security during the hunting season. Private landowners have expressed concern that increasing numbers of elk are causing degradation of haystacks and impacting their grazing range during the winter months. People who use the National Forest for logging, mining, and grazing, and motorized recreation are concerned about what they consider excessive restriction of their activities to benefit elk habitat.

Trout spawned in Forest streams provide recreation opportunities for fishermen and are a valuable source of fry for downstream blue ribbon fisheries.

Resource Relationships

Elk and domestic livestock compete for winter and summer forage and use of key habitat components, such as wet meadows and springs. Timber sales remove security cover, impact key habitat components, and increase ease of hunter access. Mineral activities may also impact security cover (through road building) and increase hunter access.

Trout populations in the Forest are influenced by water quality, habitat improvement, and fishing pressures. Water quality and quantity can be impacted by timber harvest and road building activities, and by use of riparian areas by domestic livestock.

Procedure to Address

All alternatives provide adequate forage on the Beaverhead winter ranges to carry the numbers of elk (4150 elk) compatible with overall winter range capacity (11,650 elk) as determined through Forest Service and Montana Fish, Wildlife and Parks analyses. Increases in livestock or transitory range may cause some livestock/elk competition for key habitat areas, such as wet meadows, wallows, etc. Summer forage for elk is adequate under all alternatives.

Elk security levels and key habitat component quality is effected by the magnitude of timber harvest. The greater the amount of timber harvest and road building, the greater the reduction of elk security. Alternatives that have more harvest per acre of suitable land have a greater chance to adversely impact key areas, such as elk wallows and nesting trees for nongame birds. Each alternative is evaluated to determine its potential impact to elk security and key habitat protection.

Increases in fish populations will depend on habitat improvement projects that are implemented in accordance with intent of each alternative. Habitat improvement will be achieved through channel improvement, lake deepening, barrier removal, etc. Standards, both Forestwide and Management Area-specific, will protect watersheds and riparian zones. Control fishing pressure will depend on joint effort with the Montana Department of Fish, Wildlife, and Parks. They can control species and limits, and the Forest Service can restrict or facilitate access to fishing areas.

ICO 5: What additional road rights-of-way are needed to provide reasonable public access to National Forest lands buffered by private ownerships?

Rationale

The Beaverhead Forest has approximately 900 miles of exterior boundary between National Forest and private ownership. Although there are many roads that reach the Forest boundary, many are on poor locations, are unsuitable for automobile travel, or lie where it is impractical or unsuitable to improve the road. Only a few (approximately 25 percent) of these raods are open to the public through rights-or-way vested in the Forest Service or another road management agency.

People have expressed the need for additional access to the National Forest for recreation, hunting, fishing, mineral exploration and development, timber harvest, firewood cutting, and many other activities. Private landowners, on the other hand, have expressed concerns about public use of existing and/or future roads through their properties.

Resource Relationships

Road and trail rights-of-way across non-National Forest land must be adequate for the protection, administration, and use of the National Forest. These rights-of-way must be acquired in time to meet road and trail construction for resource development program schedules of the selected alternatives.

Procedure to Address

Under current management additional points of access are needed. Management alternatives other than current direction are likely to require as many or more points of access. It is unlikely that fewer points of access will be needed.

When a preferred alternative is selected, the road and trail access necessary to implement that alternative will be determined. In many cases, only broad corridors will be identified with specific location to be done at the time it becomes necessary to secure the access. Acquisition will be programmed on as even a work flow as possible to meet program needs of the selected alternative.

ICO 6: What effects will management area designation and management of surface resources have on access for exploration and development of mineral and energy resources? How should effects that make access difficult or costly be considered in assignment of management areas?

Rationale

The Beaverhead National Forest has significant potential for energy and nonenergy resources. The location, identification, development, and production of these resources are highly dependent upon road access to large undeveloped areas. If access to certain areas is restricted, the cost of exploration in these areas will increase to the point that no exploration may occur. This will result in a decreased probability that undiscovered, valuable mineral or energy deposits located in these areas will ever be found.

The mineral and energy industries are concerned that Federal lands remain open to exploration and feasible to explore in order to meet national needs for mineral and energy resources. Other individuals and groups are concerned that exploration for and extraction of mineral and energy resources may adversely affect values of other surface resources, primarily unroaded recreation and wildlife habitat.

Resource Relationships
Conflicts exist between roading for minerals and energy exploration and development and unroaded recreation or wilderness designation. Conflicts are also possible with wildlife (security) and fisheries (where riparian zones are likely to be impacted by roading). Access for timber and for range management are, in most instances, compatible with the access goals of minerals and energy interests.

Procedure to Address
Access opportunities for minerals and energy are provided in each alternative as a result of assignments for management of other surface resources. Ease of access is a function of the management area assignments (more or less ease depending on the need for roads for other surface resource management in the prescription applied) which, in turn, is a result of the intent of the particular alternative.

Standards to coordinate minerals and energy exploration and development activities with other resource values are set forth in the Forestwide Standards and in the standards for each Management Area where these activities are permitted.

ICO 7: What inventoried roadless areas should be recommended for wilderness? Are there portions of inventoried areas that should be excluded from recommendation because of conflicting uses or new information? How should the inventoried roadless areas not recommended for wilderness be managed?

Rationale
Approximately 8 percent of the Beaverhead National Forest is classified wilderness: 101,000 acres in the Lee Metcalf Wilderness Area and 72,500 acres in the Beaverhead's portion of the Anaconda-Pintler Wilderness Area. In addition, approximately 1.2 million acres of the Forest are inventoried as roadless.

In the final RARE II recommendations, approximately 150,500 acres were recommended for wilderness and 288,000 for further studies to be led by other Forests; approximately 22,400 acres were "released" for nonwilderness uses. The West Pioneer and Madison areas were included in the Montana Wilderness Study Act, PL 95-150. In the first draft (issued Fall, 1982) the Forest did not address the wilderness/roadless issue, because it was assumed that RARE II process would resolve wilderness designation of the inventoried roadless lands and that the Montana Wilderness Study Act and the Lee Metcalf Wilderness Bill would resolve the wilderness questions in the West Pioneer and Taylor-Hilgard (Madison) areas, respectively.

The Forest had already begun to develop the Final Plan and EIS when, in September 1983, the NFMA regulations were amended to require each Forest to prepare, using specific criteria, an inventory of roadless lands and to evaluate each of these areas for wilderness in its land and resource planning process. The Forest then incorporated the wilderness issue and inventoried roadless area analysis into the Forest planning process.

In general, public response to the wilderness issue has been strongly polarized. On one side are those who are interested in keeping the roadless areas of the Forest in as much a natural state as possible, and many of these individuals feel that wilderness classification is the answer to their concerns. Some individuals state that the primitive character of the unroaded lands could be protected by a "backcountry" or "scenic" designation where roading would be prohibited but some uses restricted under a wilderness designation would be allowed. On the other side of the concern are those who want access within the Forest for recreation, hunting, fishing, mineral exploration and development, timber harvest, firewood cutting, and many other activities.

Resource Relationships
Conflicts exist between development-oriented resource uses, such as timber harvesting and access for and development of minerals and energy resources. Conflicts also exist with motorized and developed types of recreation. Grazing resources are not necessarily in conflict with either wilderness or unroaded designation; however, some of the practices, such as vegetative manipulation and extensive range improvement construction, could have some impacts on the desirability of an area for future wilderness classification.

Procedure to Address
Each of the alternatives assigns a portion (or all) of the inventoried roadless lands to a wilderness prescription, depending on the intent of that alternative. In addition, a custodial management prescription is applied to in each alternative to acres that will remain unroaded unless a road is needed across those lands to manage resources in other management areas.

The Forest will maintain a roadless area inventory as implementation of the preferred alternative is achieved. This inventory will provide the "starting point" for wilderness consideration of roadless lands in the next planning process or update.

IV. Issues and Concerns Determined to be Outside the Forest Planning Process

Through public involvement, a number of issues and concerns were received over which the Forest and/or the Forest Service has no control. A summary of these are as follows:

Hunting pressure is controlled by the number of licenses and permits sold by various States. The Forest Service does influence the number of permits sold by cooperating with the various State Game Agencies. The Forest Service also indirectly affects hunting pressure by controlling access to some areas in cooperation with these State Agencies.

Restrict minerals development: The Forest Service does not have the authority to restrict most types of locatable mineral exploration and/or prospecting except in wilderness areas. Minerals development is encouraged on National Forest lands by Congress and the President. This subject is dealt with in ICO 6.

Less planning and/or regulations: The current planning effort is required by the National Forest Management Act. Regulations are most commonly used to protect resources as required by laws and Executive Orders (such as travel restrictions to protect fragile areas or roads when they are most vulnerable to damage by misuse).

The Forest needs to consider the impacts of rural population booms with possible major oil and gas and mineral discoveries: The impacts can be considered in the planning process; however, this issue cannot be resolved through the Forest Plan.

Where should pipeline and powerline corridors be located where they would create the least impacts on resource values and uses: This issue is addressed at the Regional Office level and coordinated with the appropriate agencies at the time any corridor is proposed. The Forest provides input to the Regional Office on request.

Road costs should be shared by all users: Road cost procedure is determined by Regional standards and transportation analysis.

Require the timber industry to do planting: Requirements of this nature are established by Regional direction.

Reduce the standard size for clearcuts: Clearcut size limits are set by NFMA guidelines and the Regional Guide.

Should private landowners receive special grazing consideration to compensate for wintering wildlife on private land: This is a Regional policy decision.

Persons who live near and derive their livelihood from the National Forest should carry more weight in the decision-making process than others who do not: Policies directing consideration of public input originate at the National level. All public input is considered to be important. Consideration of community stability and life styles is an integral part of the social analysis done in Forest planning.

APPENDIX B

Where should pipeline and powerline corridors be located where they would [illegible] the least impacts to resource values and uses. This issue is addressed at the Regional Office level and coordinated with the appropriate agencies at the time any corridor is proposed. The Forest provides input to the Regional Office on request.

Road costs should be shared by all users. Road cost [illegible] is determined [illegible] Regional standards and transportation analysis.

Require the timber industry to do planting. Requirements of this nature are established by Regional direction.

Reduce the standard size for sawtimber. [illegible] guidelines and the Regional Guide.

Permit private landowners receive special [illegible] consideration in compensating [illegible] wildlife on private land. This is a Regional policy decision.

Because the time and [illegible] from the National Forest [illegible] weight in the decision-making process than others who do not. Policies directing consideration of public input originate at the National level. All public input is considered on its [illegible]. Consideration of community stability and life styles is an integral part of the social analysis done in Forest planning.

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APPENDIX B

DESCRIPTION OF THE ANALYSIS PROCESS

I. Introduction

A. Planning Problem

The Forest Service is responsible for determining how best to manage National Forest System lands based both on public desires and land capabilities. The capability of the Beaverhead National Forest is influenced by its high altitude setting on the slopes of the Continental Divide with short growing seasons and harsh winters. The Forest has the climatic and vegetative conditions of both the east and west sides of the Divide. Almost two-thirds of the Forest is currently unroaded. Generally the topography allows for easy recreational access by off-road vehicle, foot, or horseback, but passenger car access is limited. The National Forest lands are scattered and share about 900 miles of boundary with other landholders. The Forest supports sizeable elk populations, and National Forest lands are the headwaters for renowned blue-ribbon trout fishing streams and rivers. Lodgepole pine constitutes a large portion of the scheduled timber harvest program. Mineral interest in the area is intense. Locatable mineral activities have a long history while leaseable minerals, particularly oil and gas, are only recently receiving intense scrutiny. Domestic grazing is a predominate use of National Forest lands and local ranchers depend upon Forest Service allotments. In addition, there is a dependent local woods products industry, numerous dependent water users, and some dependent outfitters and guides.

Public interest includes divergent viewpoints about the use of commodities such as timber, grazing and minerals and noncommodities such as wilderness, unroaded recreation, scenery, wildlife, old growth and diversity. The Forest's major planning goal is to provide enough information to help decisionmakers determine the combination of goods, services and proposed land uses that will maximize net public benefit (See Section IV A for an explanation of this important concept). The National Forest Management Act (NFMA) and the regulations developed under NFMA (36 CFR 219) provide the analytical framework to address this objective, and also state that the requirements of the National Environmental Policy Act (NEPA) and its regulations (40 CFR 1500-1508) must be applied in this analysis process.

B. Planning Process

The planning and environmental analysis process brings a new outlook and a new technology to National Forest land management, principally: (1) processes formerly used to make individual resource decisions are now combined to help make integrated management decisions; and (2) new mathematical modeling techniques are used to assist in the problem of assigning and scheduling proposed land uses including identifying the most cost-efficient pattern of land management. The 10-step planning process is discussed in the NFMA regulations and in Chapter I of this document. Appendix B describes the analysis phase of this process including steps 3, 4, 5 and 6. The judgement phase, steps 1, 2, 7 and 8, is described in

Chapters I, II, and in Appendix A. The execution phase, steps 9 and 10, is presented in the Forest Plan.

1. Inventory Data and Collect Information (Planning Step 3)

The interdisciplinary team determined what data was necessary based on the issues and concerns. The analysis of the management situation, formulation of alternatives and monitoring require data on resource capabilities, existing supply and demand, expected outputs, benefits and costs. Existing data was used whenever possible but was supplemented with new data to help resolve sensitive issues or management concerns. Data is on file in the Beaverhead National Forest Supervisor's Office.

2. Analysis of the Management Situation (Planning Step 4)

This analysis examines resource supply and market conditions and determines suitability and feasibility for resolving issues. A resource scheduling model (FORPLAN) was used to address a number of specific requirements, including benchmarks. Requirements include: (a) the projection of the Forest's current management program; (b) determining the Forest's ability to produce a range of goods and services from minimum management to maximum production; (c) evaluating the feasibility of reaching the national production goals (RPA objectives) and social demands identified as issues and concerns; and (d) identifying monetary benchmarks which estimate the output mix which maximizes present net value (or minimizes the cost) of resources having an established market or assigned value and meeting other departure analysis requirements. The analysis of the management situation (AMS) and analysis of the management situation update documents are on file in the Forest Supervisor's Office.

3. Formulation of Alternatives (Planning Step 5)

The information gathered during the first four planning steps is combined and analyzed to formulate alternative management plans. The alternatives reflect a range of resource management direction. Each major public issue and management concern was addressed in one or more alternatives. Management prescriptions and practices were formulated to represent the most cost efficient way of attaining the objectives for each alternative. Both priced and nonpriced outputs are considered in formulating the alternatives. See Forest Planning Records: Analysis of Management Situation (AMS) (1982) and AMS Update (June, 1984) and Alternatives Update (June, 1984).

4. Estimation of Effects of Alternatives (Planning Step 6)

The physical, biological, economic and social effects of each alternative were estimated and analyzed to determine how each responds to the range of goals and objectives assigned by the RPA program. FORPLAN was used to estimate some of the economic and physical output effects while other methods were used for remaining effects. The analysis included: (a) direct effects; (b) indirect effects; (c) coordination with other Federal, State, local and Indian tribe land use plans; (d) other environmental effects; (e) energy requirements and conservation potential; (f) natural or depletable resource requirements and conservation potential; (g) historic and cultural resources; and (h) means of mitigation.

II. Inventory Data and Information Collection

A. Forest Data Base

The Forest data base has been corrected, since the Revised Draft EIS, to include an additional 10,000 acres in the Lee Metcalf Wilderness obtained through the land exchange mandated by the legislation classifying the area wilderness. The analysis areas used in FORPLAN were expanded as a result from 594 to 595 areas.

The information presented in the land class summary (Table B-1) is presented in a slightly different format.

1. Capability Areas

The capability areas developed for the Beaverhead National Forest have the following characteristics.

Each capability area occurs entirely within one county, one Ranger District, and one timber compartment; each is either entirely private or entirely National Forest land; and each is entirely within or outside classified Wilderness. The capability area may include portions of more than one range allotment, but boundaries coincide with fenced allotment boundaries. Each capability area is generally uniform in slope, aspect, elevation, landform, bedrock, [illegible] pattern of vegetative cover and soil but may include parts of more than one timber subcompartment, timber stand, or drainage. Because they were delineated for different purposes, boundaries of timber compartments, private land, and range allotments almost always split landtype delineations.

2. Analysis Areas

Analysis areas are one or more capability areas or parts of capability areas combined for the purpose of analysis in formulating alternatives and estimating various impacts and effects (FSM 1920.5). Capability areas were further stratified by existing timber types or condition classes and then aggregated into analysis areas based on similarities in capability, timber types, and economic effects. There are 595 analysis areas.

3. Production Coefficients

Resource outputs were developed for each analysis area by assigning resource suitability and economics to analysis areas. Analysis areas suitable for timber production were linked to timber type maps which were linked to timber outputs. Analysis areas suitable for cattle grazing were linked to range allotment maps which were tied to forage production estimates. Forage production for elk was constrained by the amount of suitable winter range and by the amount of forage that would be available given a specified amount of domestic livestock grazing. Recreation coefficients were tied to capacity of an area to absorb recreationists while still providing a specific type of recreational experience and setting. Other resource data including costs, benefits, slope, geology, and riparian areas were utilized to further refine or constrain outputs.

Production coefficients used on the Forest were expressed in the following units:

Timber	Thousand cubic feet/acre
Dispersed recreation-Type I	Thousand RVD's/acre/year
Dispersed recreation-Type II	Thousand RVD's/acre/year
Dispersed recreation-Type III	Thousand RVD's/acre/year
Winter elk forage	Thousand AUM's/acre/year
Livestock forage	Thousand AUM's/acre/year
Local road construction	Miles/acre/year

4. Suitable Lands

All acres of the Beaverhead National Forest were considered tentatively suitable for some kind of resource management practices. All areas were considered tentatively suitable for some form of recreation activity and as wildlife habitat. Roadless area size and evidence of human activities were used to determine wilderness suitability. Habitat type and inventory data were used to determine areas tentatively suitable to be managed as elk winter range. The timber and range suitability analyses are discussed in more detail below.

a. Timber

Beaverhead NF personnel used forest habitat type, soils, timber type, legal status and inventory data to determine the acres displayed in Table B-1 that are tentatively suitable for timber management practices.

The acres within the net National Forest area that are water were determined by identifying acreage of Photo Interpretative 92 (water) from the FINSYS data.

Nonforest land was also determined by identifying the acreage of Photo Interpretative Type 93 (nonforest) from the FINSYS data.

In addition, administrative sites, developed campgrounds, and resorts operating under special use permits were removed from the capable land base.

Lands not capable of producing 20 cubic feet per acre per year were removed from the land base, including nonproductive habitat types (productivity class 7). The "0" working group was not considered to be capable of timber production. This group includes noncommercial forest, grasslands unsuitable for range, rock outcrops, talus and scree, high elevation alpine land, and very steep rocky slopes.

There are no areas on the Forest that are eliminated from the capable land base due to regeneration problems. That is, there is the technology available to produce timber without irreversible resource damage and to assure restocking so long as proper management practices are used.

Lands not available for timber production include classified wildernesses (the Anaconda-Pintler Wilderness and the Metcalf Wilderness) and the Cliff Lake and

Cottonwood Research Natural Areas. The West Pioneer Wilderness Study Area is not available until Congress makes a wilderness/nonwilderness decision for the area based on the Montana Wilderness Study Act Draft Environmental Impact Statement for the Taylor-Hilgard, Mt. Henry, and West Pioneer Wilderness Study Areas. In this document, the Forest Service recommended nonwilderness management for the West Pioneers.

Table-B-1

Land class categories	Total acres
1. Non Forest Land (includes water)	558,488
2. Forest Land 2/	1,589,033
3. Land withdrawn from timber production	174,043
4. Forest Land not capable of producing crops of industrial wood	469,624
5. Forest Land physically unsuitable:3/ --irreversible damage likely to occur --not restockable within 5 years	136,197
6. Forest Land -- inadequate information 1/	----
7. Tentatively Suitable Forest Land (Item 2 minus Items 3,4,5, and 6)	809,169
8. Total National Forest Land (Items 1 and 2)	2,147,521

1/ Lands for which current information is inadequate to project responses to timber management.

2/ Includes non-forested acres included in existing designated wilderness areas.

3/This category includes lands in the "o" working group not already removed from the suitable land base because they are nonforest, or noncommercial forest. The remaining "o" working groups removed in this category are isolated pockets of timber, steep and rocky slopes, surrounded by noncommercial forest.

b. **Range**

Approximately 26 percent, or about 575,000 acres of the Beaverhead NF are available, capable and tentatively suitable for grazing by domestic livestock.

Available lands are those that do not have statutory or administrative withdrawals associated with them.

Capable lands are those for which the capability to provide adequate and appropriate forage has been determined dependent upon four key factors--soil productivity, available moisture, plant vigor, and competing vegetation. The working groups were grouped into three categories based on their potential to produce forage as influenced by soil productivity and moisture.

High Production Potential	Medium Production Potential	Low Production Potential
P	LMT	H
W	S	O
	I	
	A	
	DW	

Definitions for the working groups are in Section III C 4.

In addition, forage potential production was evaluated in terms of the health or vigor of the plant through the management prescriptions. Vegetative condition classes of excellent, good, fair, and poor were assigned and it was assumed that forage production would increase as the condition of a site was improved to the next higher condition class.

Opportunities to limit competing vegetation and thereby enhance forage production are available through investment in range improvement activities.

Lands available and capable may still not be suitable because although producing substantial amounts of forage, they may be too steep or inaccessible for domestic livestock use. Therefore, only the slope class of 0-45 percent was considered tentatively suitable for livestock grazing and then only if already determined to be available and capable of forage production.

5. **Prescription Assignment and Scheduling**

The condition classes of existing vegetation were used to schedule management activities over time for the various benchmarks and alternatives.

6. **Monitoring**

Forest planning data provides a base from which changes can be measured and will also be used to monitor implementation activities.

7. Plan Implementation Programs

The data base provides biological and physical data that will help develop subsequent programs for plan implementation. As more information is available, the data base will be updated and improved.

B. Sources of Data

Sources of existing inventory data used in the analysis are as follows:

1. Forest Service Manual, Management Information Handbook (MIH 1309.11) provided definitions for outputs, activities, effects and other information.

2. Vegetative habitat types were inventoried in conjunction with the Beaverhead National Forest Land Management Plan of 1978. The process is currently documented in Forest Habitat Types of Montana (Pfister and others, 1977).

3. Land types were derived from the most current project or unit plan inventory maps.

4. Resource maps used in timber planning included photo interpretation type maps, interim land use class maps, a composite timber stand map, and habitat type maps.

5. A risk rating map delineating high risk areas for mountain pine beetle infestations and the most recent aerial reconnaissance maps of insect and disease attacks were used.

6. The national watershed identification system was used to identify regions and subwatersheds on the Forest. Map Base and Overlay Legend, 1/82. Based on U.S.G.S. Hydrologic Unit Map, 1974.

7. Compartments are the timber compartments identified in the timber inventory system and are subdivisions of the subwatersheds, map base, 1/82.

8. Administrative boundaries are delineated on the Beaverhead Forest Map, 1981.

9. Slope was used in conjunction with land types to help delineate analysis areas. The slopes were extracted from U.S. Geological Survey maps.

10. Timber outputs were derived from the 1975 timber inventory. Timber types or size and condition classes were developed by Forest Service personnel.

11. U.S. Geological Survey maps were utilized to delineate streams, lakes, and riparian areas.

12. A map of current water users and the watershed condition survey were used in the analysis of impacts.

13. The recreation opportunity inventory data base and recreation preference maps were utilized to map opportunities and develop capacity coefficients. The Recreation Information Management System was utilized to develop recreation visitor days. Hunting recreation was developed from Elk and Deer Hunting Opportunity Evaluations (Reid, 1981 July 1).

14. Elk and livestock forage information was adopted from Range Analysis Handbook, FSH 2209.21-R1; Wildlife Surveys Handbook, FSH 2609.21; Clipping Studies (USDA Forest Service), and Production Coefficients and Economic Guidelines for Big Game and Livestock, (Reid, 1981, July 1).

15. Allotment status data, allotment management plans and records, and range condition maps were used to define the current situation.

16. Geologic information was developed from Alden (1953),Berg (1979), Fraser and Waldrop (1972), Hadley (1969a, 1969b), Hadley et al (1980), Heinrich and Rabitt (1960), Klepper (1950), Lopez (1982), Montana Geological Society (1960,1967, 1981), Ross (1963), Ross et al (1955), Ruppel (1978,1982), Ruppel et al (1983), Schotten (1955), Skipp et al (1979), Sonderegger et al (1982), Staatz (1973, 1979), Tansley et al (1933), Tobacco Root Geological Society (1982), Wier (1982), Witkind (1972, 1976, 1982), and Witkind and Prostka (1980).

17. Geologic favorability was developed according to the BLM's "Energy nd Mineral REsource Data Gathering in Wilderness Study Areas; Request for Public Comment" published in the Federal Register Part II, on December 10,1981. This document defines geologic favorability as "the potential of a particular geologic environment to contain mineral and energy resources". Favorability does not consider the feasibility of extraction, the accessibility of the tract, or other factors that might preclude economic development of the resources. Favorability is a rating of the resource based on the 1) adverse, to 2) permissive, to 3) suggestive, to 4) highly suggestive nature of the geologic framework present within and adjacent to an area.

18. Background sediment and sediment from management activities were predicted from: Megahan (1976), Emmett (1975), USDA Forest Service (1980).

19. Background water and water yields which result from management activities were predicted from Garn, 1974.

20. The visual resource was mapped using the Visual Management System (USDA Forest Service, 1977).

21. Stumpage value was based on bidder transaction evidence for 1974 to 1980; price trends for Haynes and Adam (1980); other resource values (price trends) from 1980 RPA reports (Beasley, 1978); and costs were developed by Forest personnel as documented in Planning Record: Management Practices, 1983.

22. Social and economic data was gathered under the guidance of the Regional Social Scientist and documented in the Social and Economic Overview for Beaverhead National Forest.

23. The Forest travel plan map and transportation plan map "B" were used to establish the existing road system in conjuction with USDA Form 7700-9R

which lists all system roads and their physical conditions. Traffic counts on Forest and in the State were also used.

24. Fisheries coefficients were based on estimates obtained by the Montana Department of Fish, Wildlife and Parks (1981) and adjusted by the zone biologist as documented in the Forest planning records.

III. The Forest Planning Model (Including FORPLAN)

A. Overview

The Forest planning process uses several land use and resource management models that are designed to analyze relationships between a variety of managment activities and/or resource outputs. These models include FORPLAN, discussed in detail below; IMPLAN, an input-output model used to estimate socio-economic impacts of resource outputs (see section V.C.); a sediment model used to estimate sediment production (over natural base) associated with resouce outputs; a habitat effectiveness model developed to assess the related impacts of timber harvest and road management on elk habitat; and a fisheries model designed to predict potential fisheries habitat capability as it is affected by resource management activities. Additional information on each of these models is available in the Beaverhead National Forest planning records.

B. FORPLAN

FORPLAN is a linear programing computer model designed to analyze thousands of possible management activities, practices, and resource outputs on specific land areas in order to select an optimal set capable of meeting various management constraints and goals (objective functions).

The specific land areas, analysis areas, were delineated by characteristics which have a fairly uniform response to management activities, costs, and benefits. Management activities and practices were assigned to analysis areas based on their suitability (see Part C of this section). Specific combinations of activities and outputs were assigned to analysis areas to represent various multiple use prescriptions called management prescriptions. Each of the 595 analysis areas has from one to twelve management prescriptions.

Resource outputs or production coefficients were developed for each combination of analysis area and management prescription. FORPLAN assigns those management prescriptions to analysis areas which produce the goods and services that optimize the objective function, after meeting all constraints.

Alternatives were generated by constraining management prescriptions available to analysis areas, constraining the scheduling of activities associated with prescriptions to particular decades or sets of decades, or constraining the outputs from analysis areas or groups of analysis areas. These constraints were designed to achieve the goals of an alternative. The conditions set by the constraints must be satisfied before optimization of the objective function can be attempted. The analysis of the benchmarks and alternatives utilized the same objective function, to maximize present net value. In other words, after meeting all constraints the FORPLAN model assigned and scheduled the remaining opportunities to produce the most economic value.

1. Analysis Process and Analytical Tools

Analysis leading up to FORPLAN included designing management prescriptions, assigning practices to prescriptions, developing management costs for each practice and predicting resource outputs, and benefits. Complete documentation of the analyses associated with each of these tasks is included in the Forest planning records. (Planning records are organized to correspond to the requirements specified in FSM 1920.) Outputs predicted include timber yield, elk forage, range forage, recreation opportunities, sediment, and roads.

Cost efficiency was considered by the interdisciplinary team while they were developing a realistic and flexible set of management prescriptions. Professional judgment played a major role. Historical practices were evaluated and costs and outputs were incorporated as appropriate. FORPLAN was later used to examine the comparative cost efficiencies of prescriptions.

Practices which required analysis included road construction, timber harvest and domestic livestock grazing in riparian areas, road construction, road density, forage utilization standards, fuels treatment and timber management guidelines for reforestation, silvicultural systems, logging method and rotation age. Data from the 1975 Forest inventory was used to develop empirical yield tables for existing unmanaged timber stands and the growth prognosis model was used to develop regenerated managed and unmanaged timber yield tables (Wykoff and others, 1981).

Major decisions that resulted from the preliminary analysis include the following that apply to all management prescriptions:

> All roads will be built and maintained to Forest-wide standards and guidelines. Variations occur by land types, slope and aspect. Riparian areas will receive special emphasis. Costs (1978 dollars) range from $12,750 to $22,500 per mile for local road construction and reconstruction and from $21,000 to $37,200 per mile for arterial and collector road construction and reconstruction depending on road standard and classification, slope and soil stability. The benefits associated with the standards and guidelines focus on the minimum management requirements regarding conservation of soil and water resources.
>
> Timber sales are planned and administered to Forest-wide standards and guidelines, including coordination with cultural, visual, wildlife, soil, and water resources. Costs for planning and inventory and administration range from $25 to $89 per acre harvested. The benefits associated with the Forest-wide standards and guidelines are the ability to meet prescription objectives, including minimum management requirements.
>
> Timber slash disposal is scheduled in all timber harvest prescriptions. Reforestation activities and precommercial thinning will take place in selected timber harvest prescriptions, depending upon the condition class and land type and management intensity of the prescription.
>
> Forage utilization standards were incorporated into all mangement prescriptions to model estimates of the forage that would be available to domestic livestock, and wildlife and that reserved for maintenance of plant vigor. Limited livestock improvements and maintenance were included in all appropriate prescriptions.
>
> Mining activities must minimize impacts to other resource values. Impacts and resource damage must be repaired so far as practicable through timely

reclamation. Oil and gas exploration activities will be restricted through appropriate stipulations or prohibited where necessary to minimize impacts or protect other resource values.

All prescriptions will protect key wildlife areas through Forest-wide standards and guidelines. Wildlife emphasis prescriptions provide for more protection and for enhancing wildlife habitat.

FORPLAN was utilized to provide the basis for optimal management prescription selection and scheduling for each analysis area. This process results in selection of the most cost-efficient management prescriptions and scheduling that meet a given set of constraints and an objective function of maximizing present net value.

C. Outside FORPLAN

A social impact assessment and the identification of baseline socioeconomic conditions were developed for the local area external to FORPLAN. IMPLAN was used to model the effects of alternatives on employment and income in the local area. Developed and dispersed recreation including wilderness hunting outputs, costs and benefits, were analyzed outside of FORPLAN. Budgets for local exterior and collector roads, and some "other" costs associated with such activities as new campground construction were also developed and analyzed.

Receipts from mineral leases and special use permits were also projected outside FORPLAN. The consideration of information derived outside FORPLAN takes place in two ways: 1) limits (constraints) are later placed on FORPLAN to address concerns identified; or 2) the results of FORPLAN analysis is examined in light of and tempered by the outside information.

D. Identification of Analysis Areas (Planning Records -- 1922.21(b)(a))

The rationale for delineating analysis areas is as follows:

1. **Level I Criteria** -- Maintain spatially cohesive planning units to reflect the differences that exist in wildlife and recreation opportunities and development costs. Also, maintain geographic identifiers for public and in-service display purposes. The geographic units used follow:

   West Big Hole Planning Unit
   Pioneer Planning Unit
   Fleecer Planning Unit
   Tobacco Root Planning Unit
   Lima Planning Unit
   Gravelly Planning Unit
   Madison Planning Unit

2. **Level II Criteria** -- Delineate areas with special land status classifications or studies. Delineate areas where geographic cohesiveness is necessary for analysis. Delineate areas to show roaded or unroaded areas of the Forest. If a capability area contains roaded and unroaded land, then assign the entire capability area to the largest classification. This criteria

responds to the roadless management issue by providing a means for assigning areas identified in the RARE II process and more recently in the roadless evaluation, prescriptions that do not require roading or prescriptions that do. The areas follow:

Anaconda-Pintler Wilderness
Recommended Wilderness RARE II & 393 Areas
- B1001 North Big Hole
- 01008 East Pioneer
- I1943 West Big Hole I
- N1549 Madison (North)
- S1549 Madison (South) (Taylor Hilgard)
- J1549S Spanish Peak

RARE II Further Planning (includes MWSA)
- B1013 Middle Mountain Tobacco Roots
- 01006 West Pioneer
- 01962 Mt. Jefferson
- I1945 Italian Peak
- J1549 Madison (Jack Creek)

Undeveloped areas of 3000 or more acres: (RARE II Recommended nonwilderness and RARE II areas removed from the RARE II inventory as a result of designation to nonwilderness uses when the 1978 LMP was approved).
- A1001 North Big Hole
- A1013 Middle Mountain Tobacco Roots (includes roadless areas 1013 and A, C-G 1013)
- A1943 West Big Hole A (includes roadless areas A-C 1943)
- 01014 Potosi
- 01961 Garfield Mountain
- A1945 Italian Peaks

RARE II Areas: (Dropped out because of decision in 1978 LMP.)
- 1-003 Beaver Lake
- 1-005 Tash Peak
- 1-006A West Pioneers
- 1-006B West Pioneers
- 1-006C West Pioneers
- 1-006E West Pioneers
- 1-006F West Pioneers
- 1-008A, B, and D East Pioneers
- 1-009 Call Mountain
- 1-010 Cattle Gulch
- 1-011 Fleecer
- 1-012 Granulated Mountain
- 1-945 Italian Peak
- 1-014 Potosi
- 1-015 Bear Creek
- 1-016 McKenzie Canyon
- 1-017 Sourdough Peak
- 1-018 Timber Butte
- 1-019 Dixon Mountain
- 1-020 Four Eyes Canyon
- 1-021 Sheep Mountain
- 1-022 Crockett Lake
- 1-023 Cherry Lakes
- 1-024 Vigilante
- 1-025 Snowcrest Mountain
- 1-026 Black Butte
- 1-027 Big Horn Mountain
- 1-028 Lone Butte
- 1-029 Freezeout Mountain
- 1-942 Anderson Mountain
- 1-944 Goat Mountain
- 1-961 Garfield Mountain
- 1-962 Mt. Jefferson
- All Other Lands

3. **Level III Criteria** -- Delineate elk winter range and elk calving areas. If a capability area has both winter range and nonwinter range, then assign the entire capability area to the classification with the largest number of acres. If winter

range and elk calving overlap, record as winter range. The elk facet of the wildlife issue is the basis for this criteria. Constraints are placed on winter range to achieve proper cover/forage relationships. Also, livestock utilization is constrained.

4. **Working Group Criteria** -- Delineate commercial forest lands based on timber site productivity and the opportunity for domestic livestock range. Timber productivity classes are low (20 to 49 Cuft/ac/yr) and high (50+ Cuft/ac/yr). Maintain ability to aggregate commercial forest groups to current plan groups. Noncommercial forest capability areas will be classified as other. This criteria provides the basis for linking timber inventory and yield, wildlife and livestock forage production, and economic data to analysis areas. This criteria responds to the timber, range, and wildlife issues. The working groups used are:

    H - Forested land 50+ Cuft/ac/yr.
    MLT -Forested land 20-49 Cuft/ac/yr.
    S - Forested lands on wetter sites with higher water tables 50+ Cuft/ac/yr.
    P - Grasslands suitable for development as primary range.
    I - Grasslands unsuitable for development as primary range because of steep slopes, partial timber cover, or other site factors.
    A - High elevation subalpine and alpine grasslands with short growing seasons and shallow fragile soils.
    W - Willow bottoms, wet meadows and similar grassland sites.
    O - All lands not included in above classes--includes grasslands unsuitable for range, rock outcrop, talus and scree, high elevation alpine land and very steep rocky slopes, noncommercial forest less than 20 Cuft/ac/yr.

5. **Land Class Criteria** -- Delineate land based on the average slope of capability areas. Slope classes for timber (less than 45 percent and greater than 45 percent) will reflect different logging systems and costs. This criteria provides the basis for linking sediment coefficients, water, livestock forage utilization, logging systems and roading to analysis areas. Economic data such as road costs per mile are also tied to land classes. This criteria responds to the water, timber and wildlife issues.

6. **Condition Class Criteria** -- Delineate capable and available forest land by species, age classes and size classes. Delineate all condition classes, except timber size classes, in classified wilderness. Condition classes identify existing timber and habitat condition whereas habitat types or working groups identify timber potentials. This criteria is used to identify cover/forage relationships for wildlife, forage production and

timber yield. This criteria responds to the timber,range, and wildlife issues. The condition classes used are:

MCMSAW	Mixed Conifer - Mature Saw
MCISAW	Mixed Conifer - Immature Saw
MCSTAG	Mixed Conifer - Stagnated
MCPOLE	Mixed Conifer - Poles
MCSEED	Mixed Conifer - Seeds & Saps
MCNS	Mixed Conifer - Nonstocked
LPMSAW	Lodgepole Pine - Mature Saw
LPISAW	Lodgepole Pine - Immature Saw
LPSTAG	Lodgepole Pine - Stagnated
LPPOLE	Lodgepole Pine - Poles
LPSEED	Lodgepole Pine - Seeds & Saps
LPNS	Lodgepole Pine - Nonstocked
NCF	Noncommercial Forest
GRASS	Grass Area
RIP	Riparian Zone
HIRANG	High Elevation Area With Range
ALP	Alpine Area
ROCK	Rockland Area (includes talus and scree)
WILDER	Wilderness Forest Area

7. Analysis Area Aggregation

The delineation of analysis areas based on the criteria described above resulted in about 4,112 analysis areas, far too many to be considered in FORPLAN. An aggregation process was used to reduce the number of analysis areas.

a. The Anaconda-Pintler Wilderness was collapsed into one analysis area.

b. The condition class WTNRNG (high elevation rangeland) was aggregated with GRASS.

c. Because "A" and "P" working groups are primarily grasslands and isolated, small pockets of timber are not important in describing the overall character of the land, within a land class:

   1. Condition class RIPFOR was combined into RIPGRS using land class LT45.

   2. All Forest condition classes (MCMSAW, MCISAW, MCSTAG, MCPOLE, MCSEED, MCNST, LPMSAW, LPISAW, LPSTAG, LPPOLE, LPSEED, SPNST) were grouped into condition class NCF.

d. Because the working group "W" is primarily in wetlands, all timber condition classes were collapsed into RIPFOR.

e. RIPGRS and RIPFOR condition classes were collapsed to land class LT45 in each working group where they occur in both land classes.

f. RIPFOR condition class was collapsed across age classes in each working group and assigned an age of 100.

g. NCF condition class was collapsed across land class within a working group where NCF appears in both land classes (LT45 and GE45). The acres were assigned to the land class with the larger acreage.

h. In each working group, identical condition classes of less than 160 acres but different land classes were collapsed into the land class with the larger acreage.

These aggregation efforts still resulted in an unmanageable number of analysis areas (2,196 analysis areas). Additional aggregation was done as follows:

a. RIPFOR and RIPGRS were collapsed within a working group if their acreage was less than 50. The intent was to carry riparian areas.

b. All other condition classes were collapsed if their acreage was less than 160 acres. One hundred and sixty acres was chosen as a lower limit because it is the smallest size that can be easily mapped on one-inch scale maps.

c. Similar species and condition classes were collapsed across land class.

d. Species were collapsed to the dominant species.

This attempt at collapsing resulted in 1,413 analysis areas. The third phase of collapsing used the following criteria:

a. RIPFOR and RIPGRS were collapsed if they were less than 100 acres.

b. All other condition classes were collapsed if they were less than 400 acres.

c. Some working groups were collapsed into other working groups. These were working groups with small acreages, usually less than 200 acres. The working groups were collapsed into the most appropriately similar working group within the same level 3 code (the file was sorted by level 1, level 2, level 3, working group, land class, condition class, and age).

d. Immature saw and mature saw were often combined to the dominant condition class (within the 400-acre limit).

The third collapse resulted in 860 analysis areas.

The fourth collapse used the following criteria:

a. Riparian areas were collapsed to the largest (RIPFOR or RIPGRS) working groups.

b. Immature saw and mature saw were usually collapsed to the largest working group.

c. In general, an acreage limit of 500 acres was used, with the exception of riparian.

In the final collapse the criteria for two and three above was used with a 600-acre limit. However, it should be noted that professional judgement, not an arbitrary acre limitation, was used for all phases of the collapse. In other words, similar condition classes, regardless of acres, were aggregated before an aggregation of unique condition classes was made. For example, LPMSAW and LPISAW were aggregated before a grass NCF collapse was made.

The Beaverhead analysis had 594 analysis areas as a result of the aggregation described above.

Between development of the Revised Draft and the Final EIS, the acreage acquired by the Forest Service through the Lee Metcalf Wilderness Bill for addition to the Lee Metcalf Wilderness was incorporated into an analysis area, resulting in 595 analysis areas.

The aggregation process resulted in the following:

Timberland	Analysis Areas	Acres
Tentatively Suitable Lands	258	809,037
Technologically not tentatively suitable	51	136,197
Not capable		
Nonforest	133	558,488
Noncommercial forest	118	469,624
Not available	35	174,043
Total	595	2,141,093

The following special areas were included in the suitable and not capable timberlands; however, the acreage of each, by analysis area, has been determined to facilitate adjustments in analysis area acreage and the distribution of outputs depending on their designation:

West Pioneer Wilderness Study Area
Research Natural Areas
Developed Recreation Sites

E. Identification of Prescriptions

1. Overview

NFMA regulations define management prescriptions as "management practices and intensities selected and scheduled for application on a specific area to attain multiple-use and other goals and objectives" (36 CFR 219.3). Generally, a multiple-use management prescription is a set of treatments or practices to develop and/or protect some combination of resources on a particular land type.

The interdisciplinary team reviewed the public issues and management concerns, used professional judgment, examined appropriate research and consulted RPA Program targets for guidance in developing multiple-use management prescription goal statements and a wide range of prescriptions addressing those statements. The goal statements are as follows:

a. Custodial Managment Prescription

The goal is to manage at a custodial level, protecting existing investments and resources with no additional investment in resource production.

b. Recreation Management Prescriptions, Types I, II, and III

Goal statements for these three prescriptions relate to the nonwilderness recreational opportunities of the Forest and are designed to ensure that management provides settings for type I (primitive), type II (semiprimitive), and type III (roaded but natural appearing) recreation.

c. Wilderness Management Prescription

The goal statement for this prescription focuses on the wilderness resource, either on managing classified wilderness in accordance with the Wilderness Act or on protecting and enhancing the wilderness characteristics of areas proposed for wilderness classification.

d. Riparian Prescriptions

Four prescription goals were designed to respond to the needs for riparian management practices and activities that are responsive to wildlife and fisheries concerns. One prescription focuses on enhancement of riparian areas by implementing management practices to improve wildlife and fish habitats; another focuses on protecting riparian areas by eliminating activities that lower existing quality and quantity of water and/or habitat; another emphasizes enhancement of big game habitat and watershed conditions in the absence of livestock grazing; and the last provides for watershed rehabilitation.

e. Range Prescriptions

The goal of these prescriptions is to provide forage for domestic livestock grazing with various intensities of investment associated with each prescription.

f. Wildlife Prescriptions (Winter Range and Summer, with and without timber)

These prescriptions manage big game winter and summer ranges as necessary to provide the habitat components necessary to sustain reasonable populations.

Where timber harvest is permitted in the summer range (timber) prescription, special attention is given to cover/forage ratios.

g. Wildlife/Range Prescriptions

The goals of these prescriptions are to maintain and provide suitable wildlife habitat for big game species while also emphasizing some intensity (moderate or high) of management for domestic livestock grazing. One prescription applies only to the identified big game ranges.

h. Wildlife/Timber Prescriptions

The goals of these prescriptions focus on maintaining wildlife habitats while also managing the timber resource. Two prescriptions focus on maintaining the habitat components of big game summer range with differences in the visual quality objectives. The other prescriptions call for uneven-aged, low intensity timber management and ensure protection of a semiprimative recreation setting as well as wildlife habitat with different intensities of wildlife habitat management.

i. Range/Wildlife/Recreation Prescriptions

These prescriptions call for high investments in management of range for domestic livestock grazing while retaining suitable wildlife habitat for primarily big game species and either the primitive or semiprimitive recreation setting.

j. Wildlife/Range/Timber Prescriptions

The goals of these prescriptions require generally high investments in management of range for domestic livestock grazing while either maintaining suitable wildlife habitat or enhancing wildlife habitat through investment in habitat improvement projects. Timber management is permitted but at a low or, in one prescription, moderate intensity. Two of the prescriptions are specific to big game summer range.

k. Timber/Range and Timber/Recreation/Range Prescriptions

These prescriptions' goal statements focus on various intensities of management for the timber resource and for the range resource, while in three of the prescriptions recreation opportunities are also highlighted.

l. Recreation/Timber Prescription

The goal of this prescription emphasizes providing recreational opportunities in lightly developed areas while allowing low-intensity timber management practices.

m. Timber Prescriptions

The goals of these prescriptions is to manage for the long-term growth and production of useable wood fiber with various levels of investment and visual quality objectives associated with each prescription.

n. Special Recreation Management Area Prescriptions

These prescriptions are for areas designated as special recreation areas, with the intent of actively promoting a variety of dispersed motorized and nonmotorized recreation opportunities.

o. Developed Recreation Prescriptions

The goal of these three prescriptions is to provide recreation opportunities in a developed setting. One prescription focuses on the Grasshopper Area as a special recreation complex.

p. Research Natural Area Prescription

The goal is to manage research natural areas, and is intended to meet research natural area targets assigned to the Forest.

2. Design of Management Prescriptions

Management practices, standards and guidelines were then developed and assigned to each goal statement by interdisciplinary work groups. Practices were developed and assigned based on current research, feasibility, cost efficiency, potential for resource damage and ability to meet minimum management requirements. The Beaverhead Land Management Plan of 1978 was used as much as possible as a source of information and analysis. The management standards and guidelines needed to accomplish the goals of a prescription include the minimum management requirements, mitigation measures and resource coordination that are required by existing laws, regulations and policy. (Standard and Guidelines are discussed in more detail in the Forest planning records.)

Forest-wide standards and guidelines were developed to cover practices which are common to all prescriptions which apply that to practice. The major Forest-wide standards and guidelines are for roading in riparian areas, for collector and local road construction, for wildlife habitat management (particularly maintenance of security cover), for range management, and for the timber harvest program. See Table **B-2** for a comparison of how prescriptions respond to the Standards and Guidelines.

The result was a set of about fifty multiple-use management prescriptions with a broad range of emphasis, intensities, practices, standards and guidelines. Some of the prescriptions emphasize a specific resource such as the timber, wildlife, range, and riparian prescriptions. Intensities of management vary between prescriptions increasing the range of choices available to the FORPLAN model. Other prescriptions serve a single purpose such as the research natural area prescription. Cost efficiency was considered by the team during the development of these prescriptions.

The management prescriptions were designed to:

Project the current program into the future to evaluate implications
Explore resource potentials
Explore opportunities to improve efficiency
Explore opportunities to resolve issues and concerns
Explore opportunities to meet national objectives expressed through RPA

Completed prescriptions were reviewed, discussed and revised as necessary by the management team, the interdisciplinary team and the core team. Cost efficiency considerations are discussed at the end of this Section. The review criteria included the following check points:

Have all applicable practices been included that are necessary for accomplishment of the prescription goal statement?

Are the standards and guidelines accurately and completely described, so that associated costs and outputs can be defined?

Do they ensure cost efficient implementation of the prescription?

Is anything included above or beyond the requirements of the goal statement?

TABLE B-2

Prescription Comparison

Standards and Guidelines

Prescription		Timber Mgt.			Rotation	Maximum	Range utilization			Visual	Recreation	Road
Categories	Thinning	Even-age	Uneven-age	Salvage only	age (yrs)	opening	Wildlife	Livestock	Reserve	Mgt.(VQO)	Mgt. (types)	Construction
Custodial				X			25-65%	0-40%	35%	Ret/PRet	1,2,3	1
Recreation				X			25-65%	0-40%	35%	Ret/PRet	1,2,3,	1
Wilderness							25-65%	0-40%	35%	Preservation	1	0
Riparian			X				10-35%	15-40%	35-75%	Ret/PRet	1,2,3	2
Range							25-65%	15-40%	35%	Ret/PRet	1,2,3,	2
Wildlife		X	X		120	40 acres	35-65%	0-30%	35%	Ret/PRet	1,2,3,	2
Wildlife/ Range							35-65%	15-40%	35%	Ret/PRet	1,2,3,	2
Wildlife/ Timber	X	X			120	40 acres	30-65%	0-35%	35%	Ret/Mod	2,3	2
Range/ Wildlife/ Recreation							35-65%	15-40%	35%	Ret/PRet	1,2	2
Wildlife/ Range/ Timber	X	X	X		90-110	40 acres	30-65%	0-35%	35%	Ret/Mod	2,3	2
Timber/Range Timber/ Recreation/ Range	X	X	X		90-110	40 acre	30-65%	0-35%	35%	Ret/Mod	2,3	2
Recreation/ Timber	X	X	X		90-110	40 acres	30-65%	0-35%	35%	Ret/PRet	2,3	2
Timber	X	X	X		90-110	40 acres				Mod/MMod	3	2
Special Recreation Areas				X						Ret	1,2,3,	2
Developed Recreation/RNA's										Ret/PRet	1-5	0

KEY: Road Construction--- 0=No road construction allowed
1=Road construction permitted to meet adjacent management area objectives
2=Road construction needed to meet Rx objectives

Visual Mgt.--- Ret=retention
PRet=partial retention
Mod=modification
MMod=maximum modification

3. Prescription Purpose, Criteria, and Assumptions

The prescriptions summarized above were available in all preliminary FORPLAN runs, unless an exception is specified below. The assignment of prescriptions to analysis areas was done as an interdisciplinary process, with input from the Forest Management Team, specialists, district personnel, and forest planners.

The general criteria for assigning prescriptions to analysis areas were to ensure that a wide variety of management options were available and that these options were appropriate for the area (ie; wildlife emphasis prescriptions for winter range areas). All prescriptions are for multiple-use and call for best management practices for all resources. Resource emphasis prescriptions then add to this custodial level through increased intensity of management on one or more resources. Prescriptions that allow for timber harvest are made available only on lands tentatively suitable for timber production. (See Section II A 4).

Increased livestock forage outputs are allowed on areas deemed suitable for range. These are areas in working groups with available forage (working groups LMT, S, P, I, A, and W) and with slopes less than 45 percent. Range outputs were not modeled for timber primary emphasis prescriptions, but were modeled for range-timber emphasis prescriptions. Transitory range must be managed at moderate or high intensity for livestock forage because more investment is needed for transporting, watering and dispersing livestock. Some range prescriptions were made available on analysis areas not deemed suitable range. This was to ensure that moderate and high-intensity range prescriptions were not excluded from pockets of suitable range which exist in these areas. Most of these pockets of suitable range in these areas occur in small valleys that are in areas that are generally steep (greater than 45 percent slope). But due to the need to model the general characteristics of the area no AUM outputs are allowed in the FORPLAN model for these range prescriptions on lands generally unsuitable for range.

A broad range of wildlife emphasis prescriptions are always assigned for elk winter range and elk calving areas. These prescriptions are also available to a lesser degree in summer range areas. The only nonwildlife timber emphasis prescription in elk winter and calving areas is the pure timber moderate-intensity prescription. This is to allow for a broad range of possible management practices on these lands. The actual assignment of the timber moderate prescription in these critical wildlife areas is carefully checked by the interdisciplinary team to avoid any irreversilbe damage to these areas. This prescription still requires that wildlife habitat requirements will be considered for any activity occurring in the area.

The sixteen prescription groups are described as follows.

a. Custodial Management Prescription

(1) Purpose

Provide a custodial management level for all lands. Manage lands only to protect life, health, and safety of incidental users; prevent environmental damage to adjacent lands and prevent long-term degredation of resources.

(2) Criteria and Assumptions

Assigned to all analysis areas except wilderness areas and areas proposed for wilderness by an alternative or benchmark.

Recreation management activities occur only to prevent resource degradation.

Habitat requirements for all wildlife species occurring in an area will be considered, even though these species' habitat may not be specifically mapped in the Forest Plan. Evaluate, and where practical, provide habitat for reintroduction of native wildlife species. Fences will be designed to allow wildlife passage. Fish habitat improvement and maintenance projects will be allowed.

A low intensity of range management is maintained, implying minimum administration; only that needed to ensure permit compliance.

Timber management is not scheduled and would occur only to enhance or protect other resource values.

This prescription allows removal of mineral materials, prospecting, and exploration of energy resources with standard environmental and visual quality stipulations.

All roads not needed to protect adjacent lands will be closed.

New road building will be allowed only where needed for access to other resources, i.e. to access adjacent stands of timber in a regulated management area, or for oil and gas and minerals exploration. New roads will be considered on a case-by-case basis and may be built only if compatible with management objectives.

Fire suppression activities will follow standard initial attack procedures as recommended by current policy.

Soil and water resources will be managed as necessary to prevent long-term degredation of these resources.

b. Recreation Management Prescriptions, Types I, II, and III

(1) Purpose

These prescriptions were developed to manage undeveloped and developed lands for dispersed recreation opportunities other than wilderness. The Type I Recreation prescription provides more primitive recreation opportunities in a natural, unmodified setting. The Type II Recreation prescription provides semiprimitive recreational opportunities in areas that may or may not allow motorized use. The Type III Recreation prescription provides roaded natural recreational opportunities in lightly to moderately developed areas.

(2) Criteria and Assumptions

The Types I and II Recreation prescriptions could be assigned to all lands not classified as wilderness which can provide for primitive or semiprimitive recreational opportunities. The Type III Recreation prescription could be assigned to lands that have been developed in the past.

Other criteria and assumptions are similar to the Custodial Management prescription described above with the following differences:

Recreation management plans must provide for recreational settings compatible with types I, II, or III recreation as appropriate.

Range maintenance will be conducted annually to maintain the recreational setting.

No timber harvest is allowed in Type I Recreation areas. Salvage sales and small scale harvesting is allowed in Types II and III areas to enhance or protect resource values but is not scheduled. Any volume removed would be in addition to the allowable sale quantity.

Minerals activities would have stipulations to mitigate their impact on recreational opportunities.

Trail construction and maintenance is allowed to enhance appropriate recreational opportunities.

No road construction is allowed in Type I recreation areas. Types I and II Recreation allow roads for oil & gas leasing, for mineral development, and to access adjacent stands of regulated timber. In addition, Type III Recreation allows for new road construction to enhance roaded recreation opportunities. New roads will be built on a case-by-case basis and only if compatible with management objectives.

c. Wilderness Management Prescription (includes recommended wilderness)

(1) Purpose

This prescription is to manage designated wilderness for the maintenance, protection, and improvement of wilderness characteristics. It also provides for the protection and enhancement of wilderness characteristics in areas proposed for wilderness classification. Management will be to mitigate and resolve incompatible uses.

(2) Criteria and Assumptions

The wilderness prescription is applied to all designated wilderness areas and to areas proposed for wilderness by an alternative or benchmark. The wilderness study prescription is applied to areas being studied for wilderness or designated further planning areas in the Current Direction alternative and benchmark.

Wilderness management plans will be followed in designated areas and prepared for proposed areas within five years of classification.

In proposed areas recreation management will be to maintain wilderness values by requiring any use to be compatible with wilderness values.

Livestock forage is allowed as prescribed in the wilderness management plan. Livestock forage is allowed at current levels in areas proposed for wilderness.

No timber harvesting is allowed.

Designated wilderness is withdrawn from further mineral leasing as of December 31, 1983. Wilderness values will be protected as much as possible during valid mining activities. Stipulations will be applied on prospecting, exploration, and lease activities to maintain wilderness values.

Trail construction and reconstruction is allowed consistent with protecting wilderness resource values.

d. Riparian Prescriptions

(1) Purpose

These prescriptions are to manage riparian areas to maintain or improve the quality and quantity of water and/or wildlife and fish habitat.

(2) Criteria and Assumptions

All riparian areas not in designated or proposed wilderness are assigned to one of these prescriptions or to the custodial management prescription. Riparian areas are designated in the FORPLAN model as working groups S and W and/or condition classes RIPFOR and RIPGRS.

Other criteria and assumptions are similar to the custodial management prescription described above except that additional criteria are added as follows to further protect riparian characteristics.

Water resource plans are done to emphasize riparian values in management practices. Water quality is monitored to ensure that range and timber activities do not degrade the watershed. Municipal watersheds are managed to maintain appropriate water quality standards.

Motorized recreation will be restricted to protect riparian values. All recreation planning will accomodate the need to protect riparian values.

Wildlife practices follow the custodial prescription with additional consideration given to moose habitat. These prescriptions call for the maintenance and enhancement of composition and condition of forage species on moose range, and moose winter ranges will be closed to snow vehicles as needed.

Range management will accommodate riparian values through vegetative manipulation techniques that will maintain or improve cover to minimize or reduce erosion.

Livestock use will be limited to an average maximum of 40 percent of forage production over a rest-rotation or deferred grazing system.

Timber harvest is permitted with the objective of protecting riparian values during logging operations in the Riparian Enhancement prescription. Timber harvesting will be done on suitable lands using selection and group selection silvicultural regimes and cable harvest systems where necessary.

Stipulations will be placed on minerals exploration or prospecting activities to maintain or enhance riparian values.

e. Range Prescriptions

(1) Purpose

To provide for an emphasis on domestic livestock grazing with various intensities of investment associated with each prescription. Intensities are from low investment, extensive grazing systems designed to utilize available forage on up to intensive systems with investments in improving vegetative conditions through cultural treatments and capital investments.

(2) Criteria and Assumptions

These prescriptions are applied to areas of suitable range that are not in designated or proposed wilderness and in lands that are not key wildlife habitat. Suitable range is on working groups A, I, LMT, P, S, and W with slopes less than 45 percent.

Other criteria and assumptions are similar to the custodial management prescription described above with the following exceptions and emphasies on range management.

Low-intensity range management calls for extensive grazing systems designed to utilize available forage with minimum investments in range improvements. Moderate and high-intensity range calls for increasing cultural practices (i.e. burning) and capital investments to maintain or improve domestic livestock carrying capacity.

Livestock grazing can use from 15 to 40 percent of the average forage production depending on working group and range management intensity. Average forage production is the average forage produced over the life of a planned grazing system such as a rest-rotation or deferred system.

Road building is allowed primarily to facilitate range management practices.

f. Wildlife Prescriptions (Winter Range and Summer, with and without timber)

(1) Purpose

To manage for optimum big game habitat on key winter and summer range areas. These areas may be used as calving or fawning areas and/or as security cover areas. Management goals are to maintain or improve vegetative condition and production through livestock management and cultural practices while providing for other resource uses.

(2) Criteria and Assumptions

The Summer Range prescription is applied to undeveloped areas with key wildlife habitat and to all developed areas to ensure a wildlife emphasis management option. The Winter Range prescription is applied to all analysis areas with level three identifiers of winter range or elk calving areas.

Other criteria and assumptions are similar to the custodial management prescription with the following changes and emphasis on wildlife management.

Winter and summer range improvements projects will be planned and analyzed to ensure that adequate forage/cover ratios are maintained, a desirable vegetative composition is maintained, wildlife movement needs are accounted for, and special wildlife use areas (i.e., calving, fawning, licks) are protected.

Use of existing roads and construction of new roads will be kept to a minimum. Seasonal or permanent closures will be enforced where adverse impacts are anticipated.

Roads will be designed, located, and constructed to minimize disturbance to big game species. Special effort will be taken to minimize disturbance to key habitat areas (i.e., wallows, licks, calving, etc.)

Allotment management plans will maintain or enhance wildlife habitat through practices such as salting, rest rotation, capital investments such as fences and water developments, and vegetative manipulation (including burning) to maintain forage production.

Livestock grazing cannot exceed 30 percent of the average available forage over a livestock grazing plan, such as a rest-rotation system.

The Summer Range prescription allows timber harvesting. Timber sales and harvest activities will be planned and executed so as to minimize the disturbance to wildlife and wildlife habitat. Road spacing will be maximized and roads will be closed where necessary to protect wildlife.

The minimum timber rotation age is 120 years in wildlife alternatives, and 90 years in the other alternatives.

Hiding cover will return in 20 years on productivity class 5 lands, and in 25 to 30 years on productivity class 6 lands.

Minerals, oil and gas prospecting or exploration activities will have stipulations to retain wildlife habitat or restore habitat through reclamation. The removal of mineral materials will be conducted in a manner that minimizes impacts on wildlife habitat. Surface occupancy timing stipulations will be used to avoid adverse wildlife impacts.

g. Wildlife/Range Prescriptions

(1) Purpose

To provide a management option that coordinates forage outputs to maximize big game habitat effectiveness while also emphasizing domestic livestock grazing.

(2) Criteria and Assumptions

These prescriptions are applied to lands generally nonforested or sparsely-forested on slopes less then 45 percent within existing livestock grazing allotments. In the FORPLAN model they are assigned to working groups I, P, W, A, and to other working groups with a condition class of GRASS.

These prescriptions include the minimum custodial management prescription criteria and assumptions described above with the following differences to emphasize wildlife and range.

The high wildlife, moderate range intensities prescription gives special attention to big game ranges to provide needed forage production and thermal cover.

These prescriptions emphasize management for wildlife needs, especially in the following areas: forage/cover ratio requirements, composition of the vegetative component, wildlife movement needs, and fish habitat improvement and maintenance projects.

Seasonal road closures will be implemented for all motorized vehicles if any adverse impact to big game species is anticipated.

The high wildlife, high range intensities presription calls special attention to forage and cover for seasonal antelope needs recommended in the Western State Pronghorn Antelope Guidelines when antelope are present. This prescription also calls for the management of wet meadows and sagebrush communities to meet seasonal requirements for sagegrouse when sagegrouse are present.

These prescriptions call for livestock cultural practices which will maintain or improve forage production and carrying capacity as it coordinates with big game needs.

On big game ranges development of secondary range for livestock will not be permitted if the area is more important for big game special summer and/or winter habitat. Sufficient forage on primary and secondary range to maintain big game populations must be reserved.

Unregulated timber harvest is allowed to enhance or protect other resource values.

Minerals and oil and gas prospecting or exploration must be done in such a way that wildlife habitat is retained or can be restored by reclamation.

The removal of mineral materials must be conducted in a manner that minimizes impacts on wildlife habitat.

Arterial road construction will not be allowed on elk/mule deer calving and/or fawning ranges.

All road construction and reconstruction will require that adverse impacts on big game and fish habitat be minimized. Special effort will be taken to protect key habitat; i.e., wallows, licks, etc.

Local roads may be constructed for access to range improvements.

Trails may be constructed for stock driveways or access to range improvements. Trail construction/reconstruction will minimize any adverse impacts to wildlife habitat.

Fire suppression will be used as necessary to protect big game wildlife habitat.
Prescribed burning will be used to maintain suitable forage/cover ratios and species compositions for big game habitat and to maintain forage for livestock.

h. Wildlife/Timber Prescriptions

(1) Purpose

To provide, maintain, or improve big game wildlife habitat (especially summer range areas) and to manage for timber production. Timber management activities will be conducted in a manner which minimizes adverse impacts on wildlife and wildlife habitat.

(2) Criteria and Assumptions

These prescriptions are assigned to suitable timber lands with high wildlife values such as summer range, elk calving areas, security cover or limited winter range. These lands are generally outside of existing range allotments or are not used for grazing. Lower-intensity timber practices are emphasized on key wildlife (calving areas and winter range) areas to minimize disturbance to wildlife.

Criteria and assumptions for these prescriptions meet the custodial levels of protection described above under the custodial management prescription with the following changes and additions.

Wildlife improvement projects will be planned to ensure that adequate forage/cover ratio requirements are met, wildlife movement needs are met, and special use areas (i.e., calving, fawning, licks, etc.) are identified and protected.

Wildlife habitat enhancement projects and potential for big game species reintroduction will be evaluated and completed where practical.

The use of existing roads and construction of new roads will be kept to a minimum. Seasonal or permanent road closures will be implemented if adverse impacts are anticipated.

Timber harvesting will be done using clearcut, seedtree, shelterwood, and selection silvicultural systems.

Planting will be done if natural regeneration attempts fail, if adequate seed sources are not available, or if necessary to improve species composition.

Precommercial thinning may be used on seedling/sapling stands to achieve more rapid growth.

On slopes over 45 percent specialized yarding equipment may be required. Logging system plan and Environmental Analysis (EA) will emphasize maximum road spacing.

Minerals and oil and gas prospecting or exploration will be conducted in a manner that retains wildlife habitat or allows for restoration of habitat.

The removal of minerals materials will be conducted in a manner that minimizes impact on wildlife habitat.

Arterial road construction will not be allowed on big game calving and/or fawning areas. Arterial road construction and reconstruction will also be sensitive to other big game needs, with special efforts made to protect key habitat such as wallows, licks, etc.

All road location, design, construction and reconstruction will be coordinated to minimize disturbance to big game species.

Local roads may be constructed for access to facilitate resource management activites such as timber harvest, cultural treatments, minerals exploration, etc.

Seasonal road and area motorized vehicle closures will be used to protect big game (especially during calving or fawning periods) where necessary.

Fire suppression will be applied as necessary to protect big game wildlife habitat needs.

Prescribed burning may be applied to maintain suitable forage/cover ratios and species composition for big game habitat and to maintain forage for some domestic livestock.

i. **Range/Wildlife/Recreation Prescriptions**

(1) **Purpose**

To provide for the application of intensive grazing systems and cultural practices to improve vegetative condition. These activities will be compatible with big game habitat requirements and provide for primitive to semiprimitive recreation (Type I and II) opportunities.

(2) Criteria and Assumptions

Applied to high quality suitable rangelands (working groups I, P, and W) in undeveloped or lightly developed areas. These prescriptions are not applied to big game winter ranges or reproduction areas because they do not provide the intensity of wildlife management needed for these areas. The prescription calling for primitive recreation is applied in undeveloped areas areas not designated for wilderness or wilderness study.

The minimum level management criteria are included in these prescriptions as described above for the custodial management prescription with the following changes and additions.

Range cultural practices and capital investments are done to maintain or improve forage production as it coordinates with big game needs.

Maintenance on range capital investments is done annually.

In the prescription calling for primitive recreation generally only nonmotorized use is allowed. However, snowmobiles, trail bikes and some administrative traffic may continue where it does not conflict with Type I recreation use or the maintenance of wildlife habitat.

In semiprimitive recreation areas both motorized and nonmotorized use may be permitted.

Recreation site developments will be limited to those necessary to protect resource values. In semiprimitive recreation areas fences will be constructed around recreation sites if conflict with wildlife is a problem.

Timber harvest will not be scheduled but salvage and small scale harvesting is allowed to enhance or protect other resource values. Any volume removed is in addition to the allowable sale quantity.

Mineral and oil and gas prospecting and exploration activities with stipulations to maintain primitive or semiprimitive recreation values are allowed.

Removal of mineral materials will be done in such a manner that minimizes impacts on primitive or semiprimitive recreation values. Reclamation activities may be required.

Local roads may be constructed in semiprimitive recreation areas if needed for recreation, livestock management, or minerals use.

New trail construction is allowed, especially for stock driveways and access to improvements.

j. Wildlife/Range/Timber Prescriptions

(1) Purpose

To provide, maintain, and/or improve wildlife habitat; to maintain or improve vegetative condition and increase production through livestock management and cultural practices; and to provide for healthy stands of timber and optimize growing potential.

(2) Criteria and Assumptions

These prescriptions are applied to areas with high wildlife values such as summer range, security cover, elk calving areas, and limited winter range. These areas are generally on slopes less than 45 percent in existing livestock allotments. Areas are suitable for timber production with low to moderate-intensity timber management. Low-intensity timber management is emphasized in key wildlife areas to minimize disturbance to wildlife.

These prescriptions meet the minimum level requirements described above in the custodial management prescription and have the following changes and additions.

Wildlife improvement projects will be planned to ensure that adequate forage/cover ratio requirements are met, vegetative composition is favorable to wildlife, wildlife movement needs are met, and special use areas (i.e., calving, fawning, licks, etc.) are identified and protected.

Habitat enhancement projects and potential for big game species reintroduction will be evaluated and completed where practical.

Use of existing roads and construction of new roads should be kept to a minimum. Seasonal or permanent closures will be enforced if adverse impacts are anticipated.

Range capital investments will be made and cultural practices will be done to maintain or improve forage production as it coordinates with big game needs.

Range maintenance will be conducted annually.

Timber harvesting will be done using clearcut, seedtree, shelterwood, and selection silvicultural systems.

Planting will be done if natural regeneration attempts fail, if adequate seed sources are not available, or if necessary to improve species composition.

For areas in moderate-intensity timber management, precommercial thinning may be used on seedling/sapling stands to achieve more rapid growth.

On slopes over 45 percent, specialized yarding equipment may be required. Logging system plan and EA will emphasize maximum road spacing.

Motorized recreation use may be restricted to prevent resource damage.

Minerals and oil and gas prospecting or exploration will be conducted in a manner that retains wildlife habitat or allows for restoration of habitat.

The removal of minerals materials will be conducted in a manner that minimizes impact on wildlife habitat.

Arterial road construction will not be allowed on big game calving and/or fawning areas. Arterial road construction and reconstruction will also be sensitive to other big game needs, with special efforts made to protect key habitat such as wallows, licks, etc.

All road location, design, construction and reconstruction will be coordinated to minimize disturbance to big game species.

Local roads may be constructed for access to facilitate resource management activites such as timber harvest, cultural treatments, minerals exploration, etc.

Seasonal road and area motorized vehicle closures will be used to protect big game (especially during calving or fawning periods) where necessary.

Trails may be constructed and maintained for use as stock driveways or for access to improvements. Avoid trail construction in key wildlife habitat areas (i.e., calving, fawning areas, licks, wallows, etc.).

Fire suppression will be applied as necessary to protect big game wildlife habitat needs.

Prescribed burning may be applied to maintain suitable forage/cover ratios and species composition for big game habitat and to maintain forage for some domestic livestock.

k. Timber/Range and Timber/Recreation/Range Prescriptions

(1) Purpose

To provide for healthy stands of timber and to optimize growing potential. Also, to maintain or improve vegetative condition and to increase forage production through livestock management and cultural practices. Three of these prescriptions emphasize dispersed and lightly developed recreation opportunities.

(2) Criteria and Assumptions

Assigned to suitable timber lands on slopes less than 45 percent on existing livestock allotments. These prescriptions are not assigned to big game winter or reproduction areas. The areas generally consist of timber stands and natural openings, with forage being provided by natural openings and transitory range.

These prescriptions meet the minimum level requirements described above in the custodial management prescription and have the following changes and additions.

Timber harvesting will be done using clearcut, seedtree, shelterwood, and selection silvicultural systems.

Planting will be done if natural regeneration attempts fail, if adequate seed sources are not available, or if necessary to improve species composition.

For areas in moderate-intensity timber management precommercial thinning may be used on seedling/sapling stands to acheive more rapid growth.

On slopes over 45 percent, specialized yarding equipment may be required. Logging system plan and EA will emphasize maximum road spacing.

Range capital investments will be made and cultural practices will be done to maintain or improve forage production as it coordinates with big game needs.

Range maintenance will be conducted annually.

Reserve sufficient forage on primary and secondary range to maintain current populations of big game. Temporary forage created by timber harvest will be available to wildlife and/or livestock.

Temporary forage created by timber harvest will not be considered for range improvement maintenance.

Range structural barriers will be extended where necessary to maintain the control of livestock when timber harvest removes natural barriers.

Motorized recreation use may be permitted.

Habitat enhancement projects and potential for big game species reintroduction will be evaluated and completed where practical.

Road and trail construction and reconstruction is allowed following standard practices.

Burning is allowed to maintain suitable forage/cover ratios for wildlife and/or to treat fuels for timber management.

1. Recreation/Timber Prescription

(1) Purpose

To provide recreation recreational opportunities in lightly developed areas while allowing low-intensity timber practices. Low range intensity and wildlife habitat retention are compatible practices in this prescription. Only uneven-age timber management is allowed.

(2) Criteria and Assumptions

This prescription is used in the Current Direction benchmark and Current Level alternative to model some areas as they were assigned in the 1978 Beaverhead Land Management Plan. It is not used in any of the other alternatives or benchmarks.

Motorized recreation use is allowed.

Site plans are proposed for small scale recreation development (less than 50 PAOT's).

Facilities will be consistent with Type III recreation.

Developed recreation is maintained at full service levels.

All new special use proposals will be evaluated on a case-by-case basis. No new recreation residence permits will be issued. Existing recreation residence permits will be evaluated.

Only uneven-age timber management is allowed.

Planting is not planned but will be done if natural regeneration fails.

On slopes over 45 percent, specialized yarding equipment may be required. Logging system plan and EA will emphasize maximum road spacing.

Reintroduction of native wildlife species is allowed where practical.

Fences will be designed to allow wildlife passage.

Fish habitat improvement and maintenance projects are allowed.

Only minimal investment in range improvements is planned.

Campgrounds will be fenced if conflicts with livestock occur.

Minerals and oil and gas activities must be done in a manner which minimizes conflicts with recreational opportunities.

Road construction is allowed. Project EA's will identify need for road closures.

m. Timber Prescriptions

(1) Purpose

To provide for the long-term growth and production of useable wood fiber in the most cost effective manner possible. These prescriptions also provide for dispersed recreation opportunities, wildlife habitat, and transitory livestock use.

(2) Criteria and Assumptions

These prescriptions are applied to lands with a low to moderate degree of visual sensitivity and which are available for varying degrees of timber management. Productivity class 5 and 6 lands are represented. Wildlife values such as elk security cover are present and will be given consideration in projects environmental assessments.

These prescriptions meet the minimum level requirements described above for the custodial management prescription and have the following changes and additions.

Low to high-intensity timber management practices are allowed. Low intensity calls for minimum capital investments with no planting or stocking control planned for, the moderate level calls for minimal planting needed to meet stocking requirements after the third year silviculture survey and permits stocking control to prevent stagnation of timber stands, and the high-intensity level calls for full planting needed for stocking requirements and for precommercial thinning at approximately 20 years in age to achieve more rapid growth.

Timber harvesting will be done using clearcut, seedtree, shelterwood, and selection silvicultural systems.

On slopes over 45 percent, specialized yarding equipment may be required. Logging system plan and EA will emphasize maximum road spacing.

All timber management practices will be sensitive to wildlife needs and adverse effects will be minimized.

n. Special Recreation Management Area Prescriptions

(1) Purpose

To provide for a variety of motorized and nonmotorized dispersed recreation opportunities. These prescriptions provide for current uses, including livestock grazing, unregulated harvest of posts, poles, and salvage material, and firewood cutting where compatible with recreation opportunities.

(2) Criteria and Assumptions

These two prescriptions are for two areas especially suited for dispersed recreation use on the Forest. One area is in the center of the West Pioneers, an area recommended for nonwilderness under the Montana Wilderness Study Act evaluation. The second area is adjacent to the RARE II recommended West Big Hole proposed wilderness. The only difference between the prescriptions is the area it is applied to, both have the same management practices. These prescriptions are applied to the West Pioneers in all alternatives except Alternative H and the departure, and to the West Big Hole in Alternatives H, HA, and the departure.

Recreation Area Management Plans will be developed for these areas within five years following Forest Plan approval.

Both motorized and nonmotorized use are permitted. Areas to be restricted will be determined in the Recreation Area Management Plan.

Recreation facilities will be permitted to preserve or enhance recreation opportunities as directed in the Recreation Management Plan. Recreation facilities such as portals, shelters, toilets, etc., may be constructed if identified in the Recreation Management Plan.

Grazing will be allowed on existing allotments. Site specific conflicts between range and recreation will be resolved in the Recreation Management Plan.

Timber harvest will be limited to firewood, post, pole, and salvage sawlog cutting permitted from existing roads. Harvest will be designed to protect recreation values. Productive forest land in these areas is classified as unsuitable.

Minerals and oil and gas prospecting and exploration activities will be encouraged to use cross-country travel where terrain permits, or by helicopter. Oil and gas leasing will restrict surface occupancy by location.

Following mineral operations reclamation measures will be required to restore the recreation values to the extent practical.

Trails will be maintained at appropriate levels needed for expected use. Trail construction and reconstruction needs and standards will be established in the Recreation Area Management Plan.

New roads may be constructed or reconstructed if their primary function is to enhance recreation opportunities. Road standards will be consistent with recreation opportunities.

No new roads will be allowed for minerals or oil and gas exploration unless supported by reasonable assay or seismic information.

Suppression and fuel management activities will be developed as part of the Recreation Area Management Plan.

o. Developed Recreation Prescriptions

(1) Purpose

To provide for recreation opportunities in a developed setting. Development ranges from an essentially natural environment with minimal facilities to a high degree of site modification with comfort and convenience facilities including paved roads, water systems, toilets, and boat launches. The Grasshopper Recreation Complex is included as a separate prescription. The Grasshopper complex includes the Maverik Mountain Ski Area, the Elkhorn Hot Springs Lodge, Grasshopper Campground, four recreational residence sites and a Forest Service administrative site.

(2) Criteria and Assumptions

These prescriptions are applied to approximately 40 campgrounds and/or picnic areas located throughout the forest and to the Grasshopper Recreation Complex.

Developed campgrounds or picnic areas will be maintained and rehabilitated, but generally not expanded beyond present capacity.

Site plans will be developed for proposed developments such as campgrounds, picnic areas, resorts, and winter sport complexes.

Site construction will conform to an approved site plan. Pathways and other facilities may be constructed or modified to accommodate wheelchairs where feasible.

Livestock grazing will not be permitted in campgrounds or picnic areas. Grazing may continue in the Grasshopper Recreation Complex if it does not conflict with recreational use of the area.

Tree removal will be limited to that needed to maintain or improve recreation values and provide public safety. Timber sales can be used in the creation of new ski runs.

Productive forest land in developed recreation areas is classified as unsuitable.

In developed campgrounds and picnic areas minerals and oil and gas activities are very limited. Common variety minerals will not be sold. Areas not already withdrawn from mineral entry will be recommended for withdrawal. Oil and gas leases will prohibit surface occupancy within a specified distance of the site.

A large portion of the Grasshopper Recreation complex is presently withdrawn from mineral entry. This withdrawal will be reviewed to see if expansion or retraction of the withdrawn area is needed. Oil and gas activities will be strictly controlled to minimize conflicts with recreation activities.

Roads may be constructed as necessary to meet management goals.

Fire suppression actions will be undertaken to safeguard life and property.

p. Research Natural Area Prescription

(1) Purpose

To provide for nonmanipulative research, observation and study of undisturbed ecosystems which typify important forest, shrubland, grassland, alpine, aquatic, and geologic types on the Beaverhead National Forest.

(2) Criteria and Assumptions

This prescription is assigned to existing and proposed Research Natural Areas (RNA's) identified on the Forest to meet Regional targets for examples of major forest ecosystems in southwestern Montana. The existing RNA's are Cliff Lake and Cottonwood Creek Research Natural Areas in the Gravelly Planning Unit. Cave Mountain in the Gravelly Planning Unit is currently proposed as a Research Natural Area. In addition, the Forest has identified several other areas with potential for becoming RNA's.

Improvements such as fences or buildings are generally not permitted except where needed to meet Research Natural Area objectives.

Management practices will follow guidelines for the retention visual quality objective.

Wildlife habitat improvements are not permitted.

Livestock grazing will not be permitted on established Research Natural Areas.

Timber harvest will not be permitted in these areas.

Common variety minerals will not be sold. RNA's will be recommended for withdrawal from mineral entry and mineral leasing. Recommend no surface occupancy on oil and gas lease until withdrawn.

Only nonoccupancy special use permits will be allowed.

Road construction is permitted as necessary to meet RNA objectives.

Fire suppression methods will be selected to minimize or eliminate disturbance of RNA's.

Prescribed burning may be used where feasible to perpetuate the natural diversity of plant communities.

Generally, no insect and disease control measures will be implemented unless epidemic populations exist and adjacent lands are severely threatened.

4. Use of Cost Efficiency in Developing Prescriptions

Cost efficiency was considered in developing prescriptions in the following manner. Objectives, standards, and guidelines were established for each prescription by resource element. Given the objective of the prescription, costs were estimated for resource elements to meet the standards or guidelines of the prescription. Costs of producing the outputs that would result from implementing the prescription were developed and compared to the benefit values produced. Prescriptions were carried forward if they were cost efficient in achieving prescription goals.

Two basic assumptions were used in developing prescription costs. First, costs experienced in implementing past practices were assumed to be a reasonable basis from which to predict future costs. Second, the funding for production of outputs was assumed to include the necessary funding to produce only those outputs.

5. References

Management prescription practices, standards, and guidelines are documented in Planning Record: Management Prescriptions (1981). Table B-2 compares the prescriptions to the standards and guidelines.

F. Development of Yield Tables and Coefficients

1. Overview

This section describes how yields for each resource, road construction and sediment production were developed. Some yields were developed for analysis in FORPLAN and some were analyzed outside of FORPLAN.

2. Timber

Yield tables for existing analysis areas were developed from the 1975 forest-wide inventory data. This data, rather than data from the growth prognosis model (Wykoff and others, 1981), was used to build empirical yield tables, because the growth prognosis model does not project mature and overmature lodgepole pine stands very well, a significant timber component on the Beaverhead. (See below for a description of the process). Yield tables for regenerated timber analysis areas used growth prognosis projections developed by the Timber Planner on the Gallatin National Forest for use by Region 1 East-side Forests. Both sets of yield tables are based on the utilization standards projected in the Regional Guide. The Regional Guide identifies the preferred utilization standard as 6 inch d.b.h. for lodgepole pine and 7 inch d.b.h. for all other species.

The empirical yield tables for existing analysis areas were developed by hand-fitting curves through scatter diagrams of volumes plotted by age for each combination of condition class (mature sawtimber, immature sawtimber, poles, and stagnated), vegetation type (mixed conifer or lodgepole pine), and productivity class (productivity class 5 or 6). The data from the sampled stands used for this yield table development was weighted by the probability of the stand's being selected during the inventory process. In addition, the volumes were adjusted by form and defect factors developed by destructive sampling in the timber inventory. The initial yield tables were developed by plotting cubic foot volumes; board foot yield tables were developed from those tables using conversion ratios specific by species, diameter, and land class. These conversion ratios had been established from the 1975 inventory data.

The regenerated yield tables for the East-side Forests were developed for three species groups (lodgepole pine, Douglas-fir, and spruce-subalpine fir), two productivity classes (5 and 6), and three stocking levels (200, 400, and 600 trees per acre). The regenerated tables were then made specific to the Beaverhead by weighting volumes by the proportion of species present in the vegetation groups (lodgepole pine and mixed conifer) for each of the two productivity classes. Stocking level was held constant at 600 trees per acre.

The use of existing and regenerated yield tables is limited to their respective existing and regenerated analysis areas with two exceptions. The existing "seed/sap" analysis area is allowed to access an existing yield table with regenerated yield values when the timber prescription schedules precommercial thinning. Without precommercial thinning, the yield comes from the more conservative existing yield tables. The same is true of the regenerated "seed/sap" analysis area. When the timber prescription schedules precommercial thinning, the yield values come from the regenerated tables. When precommercial thinning is not scheduled, the stand can be assumed to grow similar to the stands that were used to develop the existing yield table values, so the more conservative existing values are used.

For more information on how timber yield tables were constructed on the Beaverhead, see the Planning document: Timber Yield Table Development.

Timber yields vary by condition class, working group (which is linked to prductivity class), silvicultural system, and time. First decade (1986) existing stand board foot/cubic foot volumes are shown in Table **B-3**.

Table B-3
First Decade Timber Yield

		Merchantable Board Feet/Cubic Feet Per Acre	
Vegetation Type	Condition Class	Productivity Class 5	Productivity Class 6
Mixed Conifer	MSAW	12.22/3.15	10.09/2.75
	ISAW	6.65/2.04	6.48/2.19
	POLE	5.93/1.83	6.48/2.19
	STAG		
	SEED	18.38/4.69	10.62/2.91
Lodgepole	MSAW	5.33/2/26	4.81/2.03
	ISAW	5.69/2.41	4.28/2.13
	POLE	5.07/2.15	4.53/1.91
	STAG	1.08/ .95	1.07/ .94
	SEED	20.24/4.83	13.35/3.32

Shelterwood seed cuts removed 50 to 65 percent of the basal area depending on the working group and prescription.

Selection harvests in riparian and "S" working groups were limited to one-seventh of the volume every twenty years (a 140-year rotation) in the mixed conifer vegetation group, which could be removed in either selection or group selection harvests. Group selection harvests were scheduled in lodgepole pine vegetation groups in "S" working groups at one-fifth of the volume every 20 years (a 100 year rotation).

3. **Range**

The yield analyzed in FORPLAN was forage production on suitable livestock range. Range forage production coefficients were developed using procedures in the Range Analysis Handbook (FSH 2209.21-R1). As a preliminary step in determining forage production, Forest Service personnel determined the forage requirements for livestock and wildlife as well as the amount of forage needed to prevent degradation of the watershed and to maintain existing plants' genetic vigor.

Potentially suitable rangeland occurs on all land classes less than 45 percent in slope and in all working groups with varying degrees of productivity.

4. Sediment

The data used in determining sediment yield was derived from two primary sources. Baseline sediment yield coefficients were drawn from work done for the 1978 Beaverhead NF Land Management Plan. Baseline sediment includes sedimentation resulting from natural erosion as well as sediment from erosion of roads existing on National Forest land prior to mid-1980. Geologic erosion factors, basic erosion rates, and other data were obtained from Guidelines for Predicting Sediment Yields (U.S.F.S., 1980). Baseline sediment yield (measured in cubic yards per acre) were refined from the 1978 work for this planning effort by using weighted averages to get baseline yields specific to working groups in each planning unit.

Management prescriptions without scheduled timber harvest are assumed to generate no additional sediment; therefore, areas assigned these prescriptions produce only baseline levels of sediment.

Management prescriptions with scheduled timber harvest are assumed to generate potential increases in sediment over baseline levels from roads and logging activities. (Exceptions to this norm are described below). Increases were calculated by using basic erosion rates (determined by Megahan, 1980) for roads and logging distributed over time according to logarithmic functions determined by Anderson (1975). The erosion rates were multiplied by a geologic erosion factor (keyed to parent materials on the Beaverhead NF) and a delivery coefficient (developed by Boyce, 1975, for watersheds averaging 1 square mile in size). This resulted in an annual sediment yield expressed in tons/acre. Sediment yield stabalizes by the third year after ground disturbance at a rate higher than baseline. Sediment yield increases over baseline were averaged for the planning periods then used as the multipliers applied to baseline yields, establishing sediment yields by working group and planning period.

For even-aged timber harvest prescriptions applied to working groups "S" and "W", where cut and fill slopes are not required and slopes are level to gentle, only sediment from logging is considered, reducing the multiplier. For uneven-aged timber harvest prescriptions, only sediment from roads is considered.

Sediment yield due to prescribed fire was not calculated since most slash is piled rather than broadcast burned. Sediment yield associated with wildfire cannot be predicted.

Sediment routing to a critical stream reach was not calculated, assuming that once soil entered a live stream it was sediment regardless of whether it was routed to a critical reach, reservoir, etc.

5. Recreation

Recreation coefficients were developed based on the work done for the 1978 Beaverhead Land Mangement Plan ("Options Application Matrix and Commodity Coefficients by RAU"). Recreation outputs reflecting potential were adjusted outside FORPLAN to represent projected levels of use.

Management prescriptions without scheduled timber harvest were assigned average coefficients for Type I,II,and II recreation based on working group.

Management prescriptions with scheduled timber harvest differ depending on whether they are assigned to an undeveloped or a developed analysis area. If undeveloped, the background coefficients for recreation Types I, II, and III are equal to that determined for those prescriptions without scheduled timber harvest. For Type I, the coefficient decreases by two-thirds on initial entry for timber activities and after the second entry, the Type I coefficient decreases to zero as all Type I recreation opportunities would be lost for the remainder of the plannng horizon.

In developed analysis areas, the Type I coefficient is zero. The Type II coefficient decreases after second entry (year 40) by 15 percent due to the level of development. The Type III coefficient increases 5 percent after initial entry and then remains constant for the rest of the planning period.

In summary, as an area moves from an undeveloped state to developed Type I,recreation is eventually eliminated and additional Type III recreation is provided.

Wilderness recreation coefficients were developed similiarly to the nonwilderness coefficients, using the ROI system. However, to reflect the more pristine, solitary nature of wilderness recreation settings, and to represent the absence of some Type II recreation opportunities (motorized use, for example), the coefficients were reduced; Type I and III, 25 percent; and Type II, 50 percent.

All coefficients are expressed in numbers of recreation visitor days per acre per decade and reflect potential or capacity. They reflect shifts in recreational setting as development occurs.

External to the FORPLAN analysis, recreation coefficients were modified to indicate expected levels of recreation use or consumptive trends. Recreation use projections were developed by the Northern Region Recreation Staff, using both population growth and historic use data. The projections are documented in the planning records. The shifts in types of recreation settings in alternatives were used as adjustments to the use projections.

6. Elk

The wildlife yield coefficients analyzed were potential elk forage production on winter ranges, elk effective hiding cover, and management activity intensity. Elk were selected as the primary species to use in evaluation of impacts since they are a species of high public interest and serve as an indicator of habitat quality for other species.

Elk forage yield was evaluated in FORPLAN by calculating the vegetative production for working groups and the amount that would be available, given a particular management prescription, for elk utilization. This calculation was refined external to FORPLAN to reflect actual location of winter ranges, aspect, productivity and so on.

Elk effective hiding cover is a term that relates to the ability of an area to provide security for elk. It is determined by estimating the percent of hiding cover in an area and modifying it by the density of open roads. The concept is drawn from the Montana Cooperative Elk-Logging Study (1985). Elk effective hiding cover was evaluated on a Forest-wide basis.

Elk security is also impacted by Forest management activities, primarily those associated with road construction and timber harvest. The harvest intensity index was calculated external to the FORPLAN analysis and relates timber harvest levels for the first five decades to acreage included in the suitable land base. An index of harvest intensity is produced and interpreted. High harvest levels concentrated in a small suitable land base may adversely affect key wildlife habitat components and limit opportunities to distribute management activities in a manner that would protect those components.

The assumptions underlying the use of the elk coefficients are documented in the planning records.

7. Fisheries

Potential fish yields are calculated in catchable trout outside of FORPLAN and represent habitat potential to support fish populations. The yields are derived from an analysis of the interface between timber harvest activities, sediment, livestock forage utilization and range management practices, and fisheries habitat improvement projects.

Recruitment of fisheries to downstream blue-ribbon streams and rivers was also calculated outside of FORPLAN. Recruitment is assumed to the constant proportion of the potential fish yields for on-Forest streams.

8. Roads

Local road miles were calculated within the FORPLAN model then adjusted external to the model. Roads are modeled as built during the first entry of the existing stand. The yield tables were designed to model construction of an appropriate number of miles per acre for each acre assigned a management prescription that scheduled timber harvest. The coefficients for road construction vary by working group and harvest method which is a function of land class (slope). Local roads could be built to serve timber harvest activities in working groups H, LMT, S, and I. A theoretical density was calculated based on harvest method and slope (0-44 percent slope=tractor, 45 percent+=cable). Working group "I" was adjusted to compensate for the "patches" of timber, resulting in greater amounts of road needed per acre harvested. Only cable logging is allowed in working group "S". Existing local roads and collector roads to be built instead of locals were substracted from theoretical density to obtain needed density for the yield tables.

Adjustments were necessary external to FORPLAN to ensure that local roads were modeled in a way that recognized the spacial distribution of suitable lands. FORPLAN schedules road construction miles directly proportional to acres of timber harvested. This results in an underestimation of the miles of road needed in the early decades of the planning period to connect the new harvest areas to the existing system. The total miles of local roads needed to complete the transportation system for a given alternative remained the same as calcualted in FORPLAN; however, road construction miles were moved forward to earlier decades than those modeled in FORPLAN. This was done by adding all miles for all periods for an alternative and redistributing the miles using adjustment factors for each period developed by the engineering staff.

The adjustment factors force all roads to be constructed within the first 100 years of the planning horizon. These factors also allow a smooth transition in road miles constructed per decade, with road construction the greatest in the earlier decades.

Collector road miles were calculated external to the FORPLAN model. Estimates of miles needed to access the acres assigned to management prescriptions with scheduled timber harvest were developed by the engineering staff and District Rangers. Estimates were based on professional judgement, area transporation plans, and knowledge of the potentially suitable land base.

IV. Cost-Efficiency and Net Public Benefit

This section describes cost-efficiency criteria and explains how net public benefit is derived. This analysis is required by National Forest Management Act regulations (36 CFR 219) and plays an important part in the development, comparison, and selection of Forest planning alternatives. The following diagram displays the factors included in net public benefit:

```
¶        PRESENT NET VALUE (PNV)         ¶
¶             Priced Outputs             ¶ = Total PNV
¶     Nonmarket     +        Market      ¶      ($)
¶(e.g. Recreation)     (e.g. Timber)     ¶
                                                            ¶ NET PUBLIC    ¶
                        +                                 = ¶ BENEFIT       ¶
                                                            ¶(Non-numeric)  ¶
¶                      Non-market                        ¶
¶                   Nonpriced Outputs                    ¶
¶                                                        ¶ = Total Non-market
¶ Nonquantitative         +        Quantitative          ¶     (Non $)
¶(e.g. Recreation Quality)    (e.g. Roadless Acres)      ¶
```

The section on timber benefits (Section IV-B-3-a) has been changed since the Revised Draft EIS to more accurately describe the process by which timber values were derived. In that section, also, is described the sensitivity analysis conducted relative to those values.

A. Net Public Benefit

Maximization of net public benefit is a goal of the Forest planning process. Net Public Benefit is the overall value to the nation of all outputs and positive effects (benefits) less all the associated Forest inputs and negative effects (costs) of producing priced and nonpriced outputs from National Forest lands. Thus, net public benefit represents the theoretical sum of priced outputs (PNV) plus the non-market values of nonpriced outputs. Net public benefit cannot be expressed as a numeric quantity because PNV cannot be added to qualitatively valued nonpriced outputs. In addition, not all resource outputs have been assigned monetary values and costs.

B. Present Net Value (PNV)

PNV represents the dollar difference between the discounted value of all priced outputs and all Forest costs over the 150-year planning period. Two discount rates, 4 percent and 7 1/8 percent were used to represent the real cost of money over time. Priced outputs include those outputs with market values (timber, range, forage, mineral leases, developed recreation, and special use permits) and those outputs with assigned nonmarket prices (dispersed recreation).

Each benchmark (except the Maximize Timber, Range Forage, and Wildlife Forage Benchmarks) and all alternatives were designed to achieve their goals and objectives in a manner that produces the greatest PNV. This was accomplished by solving FORPLAN with the objective function of maximizing PNV while meeting the specified constraint of the benchmark or alternative. The PNV calculated in FORPLAN is modified by including benefits and costs not modeled in FORPLAN. The modified values were used to evalute the benchmarks and alternatives. The benefits and costs not included in FORPLAN were those which do not influence nor were significantly influenced by proposed land uses and output scheduling. This section describes how the prices and costs were calculated.

1. Priced Output Parameters Used in PNV

a. Discounting

Two discount rates representing the real cost of money over time were used to solve FORPLAN and to calculate the economic consequences of the benchmarks and alternatives. The 4 percent rate approximates the "real" return on long-range corporate investments, above the rate of inflation. (Row and others, 1981). Inflation was not included in the discount rates, benefits, and costs due to the difficulty of estimating future inflation rates and because inflation would equally affect both costs and prices. The 4 percent rate was used to evaluate benchmarks and alternatives. The 7-1/8 percent rate, which is consistent with the 1980 RPA, was used to determine sensitivity of the alternatives to the 4 percent rate. This was done by recalculating the PNV of the alternative action, (derived with the 4 percent rate) using 7-1/8 percent. In addition, the Proposed Action was rerun using the 7-1/8 percent rate to both reassign the alternative's management prescriptions and calculate PNV using the 7-1/8 rate. All costs and benefits were discounted from the midpoint of the planning period.

b. Real Dollar Adjustments

All prices and costs are expressed in first quarter 1978 dollars, consistent with the 1980 RPA. The Gross National Product (GNP) implicit price deflator index is used to inflate or deflate price and cost data to this common base (FSM 1971.32b).

2. Costs Used in PNV

All agency costs were estimated for the 150-year planning period for all benchmarks and alternatives. This section discusses how costs were developed, the major expenditure categories, funding source, and the actual costs by resource.

a. Cost Development Process

Costs were developed by Forest personnel in conjunction with developing standards and guidelines for management prescriptions. The core ID team estimated costs for every management activity specified by management prescription. The costs were based on historical data and professional judgment, and approximate the minimum funds needed to achieve the standards and guidelines in the management prescriptions. Cost data was used in developing feasible and cost-efficient prescriptions.

Costs dependent on land management and timber harvest schedule were modeled in FORPLAN by entering them in the economic tables. By solving FORPLAN to maximize PNV, the cost-efficient level of agency expenditures for each prescription was estimated for 150 years. Other costs which were not modeled in FORPLAN, were developed by the planning team to meet the objectives of each benchmark and alternative. Costs calculated external to FORPLAN included costs for right-of-way acquisition and collector road construction. The actual cost data is discussed later in this section. More detailed information on data sources and FORPLAN modeling procedures is in the Forest planning records.

b. Cost Categories

Costs were stratified into three classes: fixed Forest Service costs, variable Forest Service costs, and cooperator costs (FSM 1971.52).

Fixed costs are the minimum expenditures necessary to meet legal requirements of ensuring public safety and environmental protection. These costs are defined by the minimum level benchmark and are $2,938,000/year or $1.37/acre/year. These costs do not vary by alternative and do not affect land management decisions. The costs include fixed ownership requirements, short-term maintenance of range allotments, timber, human and community, and general administration.

Variable costs change with the controlled output level specified in each benchmark or alternative. They include capital investments (the costs of creating or enhancing capital assets over time), planning and inventory, and operations costs (including annual costs of administration, management, and protection of existing resources and capital assets). Variable costs include the costs necessary to meet minimum management requirements which are in the standards and guidelines of planned activities.

Agency cooperator costs are reflected in the output prices and are not directly treated as a cost.

In most cases, expenditures are appropriated through the normal federal budget procedures. Two exceptions are in-kind payments and special collections. Road construction and reconstruction which are performed by timber purchasers are deducted from timber receipts. Second, most of slash disposal, site preparation, and reforestation costs following timber harvest are financed through special collection brush disposal and Knudsen-Vandenburg (KV) funds.

c. Cost Increases

None of the basic unit costs are expected to increase above inflation over time. However, the average unit costs of many activities will increase through time as more expensive management activities are scheduled. For example, the average road construction cost increases in the first few decades as the more rugged land classes are accessed.

d. Cost Data by Resource

Most costs are specifically associated with resource outputs (timber, range, wilderness, recreation/wildlife, minerals, soil and water). However, some costs can't be specified by resource and are called nonseparable costs. The nonseparable cost categories include: road maintenance, fire protection, and general administration.

Calculating present net value by individual resource may be misleading due to nonseparable costs that often include expenditures required to produce, enhance, or mitigate more than one resource. For example, slash disposal costs may contain a cost to mitigate visual quality. This cost appears in the timber category. Thus, the costs by resource output do not always have a direct relationship with the benefits by resource.

Costs for all management activities are displayed in Table B-4. The costs are grouped by resource program, and classified as minimum fixed costs, other additional costs, and implementation costs.

Table B-4
Costs for Management Activities

Resource	Activity	Annual Fiscal Year Costs (1978 $) Fixed Cost/Ac	Other Cost/Ac	Implementation Cost/Unit
Recreation				
	Planning & Inventory	.0163		
	Administration & Maintenance	.0105	.030	
	Trail System Maintenace & Oper	.0066		
	A & C Road Constr/Reconstr			22 M$/Mi
	Road Maintenance	.0029		
	Law Enforcement	.0048	.2646	
		.1878		
Wilderness				
	Planning & Inventory	.0009		
	Wilderness Use Administration	.0126	.2780	
	Trail Constr/Reconstr			.0456
	Trail Maintenance & Operation		.3770	
		.0135		
Fish & Wildlife				
	Admin, Pres, Surveys, Studies	.0010		
	Nonstructural Habitat Improvement			.1393
	Resident Fish Habitat Improvement			.1412
	Structural Habitat Improvement			.0772
	Structural Habitat Maintenance			.0024
	Resident Fish Habitat Maint.		.0259	
		.0010		
Range				
	Resource Planning	.0347		
	Resource Inventory			.049/AUM
	Nonstructural Improvement Maint.	.0014		
	Administration & Mgmt.	.0981		
	Nonstruct Imprvmt-Dom Livestock	.0289		.039/AUM
	Nonstruct Impvmt-Noxious Weeds			.0011
	Structural Imprvmt-Dom Livestock			.080/AUM
	Wildlife Coordination	.0266		
		.1608		

Timber			
Timber Mgmt, Planning & Inventory, Silv Exam, Harvest Administration	.0217		25 - 89 /Ac
Reforestation - KV			19 - 193 /Ac
- P & M			6 - 30 /Ac
Timber Stand Improvement			81.05/Ac
Sale Preparation			10 - 82 /MCF
Property Boundary Location	.0135		
Local Road Construction/Reconst - Layout & Design			32 - 54 /Ac
Arterial & Collector Road Const/ Reconst			21,047 - 37,243 / Mi
Timber Purchaser Road and Bridge Constr/Reconstr			12,750 - 22,500 / Mi
Road Maintenance	.1479		
Fuel Treatment & Fuel Breaks			0 - 23 / Ac
Recreation Coordination			1.60-14.48/MCF
Wildlife Coordination		23.43	4 - 38 / MCF
Soil/Water/Air Coordination			1 - 7 / MCF
	.1831		
Water			
Watershed Improvement		.875	
Admin & Maint of Improvements		.731	
Energy Minerals Management*			
Inventory & Evaluation	.0009		
Oil & Gas	.0576		
Wildlife Coordination	.0008		
	.0593		

*Not all mineral costs are in FORPLAN - some were in RPA update Tables.

Nonenergy Minerals & Geology Resource Management*	
Inventory & Evaluation	.0096
Site Specific Technical Investig	.0100
Locatable	.0181
Common Variety	.0029
Administration	.0043
Wildlife Coordination	.0004
	.0453

*Not all mineral costs are in FORPLAN - some were in RPA update Tables.

Rural Community & Human Resources	
Human Resource Program	.0063
Protection	
Fire Suppression & Presuppression	.0516

Lands	
Program Planning	.0668
Landownership Management	.0630
Property Boundary & Corner Locatn	.0054
Land Acquisition (except WCF)	.0050
	.1402
Facilities	
Transportation Planning & Invent	.0243
FA & O Facility Maintenance	.0280
Dam Administration & Maintenance	.0048
	.0571
Soil/Water/Air Management	
Resource Inventory	.0130
Administration & Management	.0343
	.0473
General Administration	
Line Management	.1043
Program Support	.1835
Common Services	.1293
	.4171

3. Benefits Used In PNV

All priced benefits were estimated for the 150-year planning horizon for all benchmarks and alternatives. Priced outputs include those resources that are or could be exchanged in the marketplace including timber, range, recreation, minerals, and special uses. This section discusses the methods used to estimate current and future values.

The prices used in the analysis reflect onsite values for all resources, i.e., the value of the resource on the Forest. The values are consistent with cost estimates for activities which produce onsite resources. Benefits are classified as market values (timber, range, developed recreation, minerals) or nonmarket values (dispersed recreation). Furthermore, some of the benefits are actual receipts or in-kind payments to the government. The receipts serve as a base for 25 percent fund payments to local governments. Finally, some of the benefits are fixed. These benefits are associated with the minimum level benchmark and are the benefits associated with no active management.

a. Timber Benefits

The value assigned to timber reflects the onsite value of stumpage to the Forest Service. With the exception of sales currently under contract, stumpage is a variable benefit. The value is the difference between the lumber price and production costs of logging and milling. The price varies by species mix, median dbh, net volume per acre, and logging systems.

The base or starting stumpage values used in the Beaverhead NF planning process were estimated using a multiple regression equation which predicts the high bid value as a function of lumber price, tree diameter, volume per acres harvested, percent of volume clearcut, total haul distance, and the number of bidders per sale. This equation was developed using data from sales sold on the

Beaverhead, Deerlodge, Gallatin, and Lewis and Clark National Forests during the period 1968 to 1979.

See Planning Record : "Developing Timber Prices--Beaverhead National Forest", J.P. Merzenich, spring 1985.

Stumpage values represent both the benefit value to society as well as the actual receipts to the US Treasury. All timber outputs from the Forest are expected to be consumed. In addition, because the real price of lumber is projected to increase faster than the real cost of lumber production, the real price of stumpage is also projected to increase. Price projections used in Forest planning have been based on research used in building the 1980 RPA Program. The projections reflect the interplay between assorted supply and demand factors. The projections show prices increasing over time so that by the fifth decade, timber values increase more than two times the base value. The price indices are (Haynes and Adams, 1980):

Decade	Lumber Price Index	Production Cost Index
1	114.5	111.8
2	142.5	136.5
3	165.3	150.9
4	186.3	154.7
5	207.3	158.1
6	218.8	159.5

The demand curve for timber was assumed to be horizontal; therefore, no downward sloping demand curve was used in the FORPLAN computer model. None of the currently available techniques for developing Forest level demand functions have a strong enough theoretical basis. See Downward Sloping Demand Curves (Reid, 1981 February 12).

Timber values are recognized to be ever-changing, dependent upon National demand for wood products, local timber supplies, and other factors not subject to the control of the Forest Service. Recent trends in the timber market have resulted in lower values than projected for use in the Forest planning analysis. In response to questions raised during public review of the Revised Draft EIS, management wanted to know what effect changes in economic assumptions would have on the FORPLAN analysis. The primary area of concern is the relative proportion of the tentatively suitable timberlands that are economically suitable. Therefore, following the public review, a sensitivity analysis was conducted to determine if the additional information gleaned from an analysis using a different set of timber values would have an influence on the recommendation of a Proposed Action and/or the decision. The following paragraphs briefly summarize that analysis. Additional details and interpretation are available in the planning records. See Planning Record: "Timber Values Sensitivity Analysis: Base Values and Future Price Trends", Beaverhead National Forest. S.Giannettino, Fall, 1985 and Winter, 1986. The purpose of the following paragraphs is to quantify the effect of data changes on the analysis and to display and interpret the implication of the changes for consideration by the responsible official in the decision-making process.

As described above, there are two major kinds of assumptions affecting timber values used in the FORPLAN model. One is the assumption about base (starting) timber values; the other is the assumption about what stumpage prices will be in the future. The sensitivity analysis tested both those assumptions.

Base timber values--The analysis has been conducted using a different set of base timber values from that displayed in the Revised Draft EIS. This different set of values was estimated based on actual receipts (cut values) for Beaverhead National Forest timber averaged for the last ten years (1975-84). Variations in stumpage values due to physical characteristics of the stand and site are modeled using the latest research and timber sale transaction information available. See Planning Record: "Calculating New Base Timber Prices for FORPLAN", J.P. Merzenich, summer, 1985.

Projected Stumpage Values--In addition to addressing a different set of base timber values, the sensitivity analysis evaluated two assumptions about price trends additional to the assumption displayed above; one assumption being no increases in the real price of stumpage over time, and the other being a lower expectation of increase over time than that used in the Revised Draft EIS. The latter set of projections is based on the research conducted by Adams and Haynes for the 1985 RPA Program, reassessing the interrelationships between supply and demand. Prices are still projected to increase over time, as indicated in the Adams and Haynes 1980 RPA Program projections, but the magnitude of the increase at the fifth decade is now a lumber value one and one half times the base value. The Adams and Haynes projections for 1985 RPA vary by alternative program; for this sensitivity analysis the projection associated with Alternative B, moderate in the array of projections, is used. The 1985 RPA price indices are (Adams and Haynes 1985):

Decade	Lumber Price Index	Production Cost Index
1	1.0	1.0
2	1.215	1.242
3	1.292	1.276
4	1.392	1.312
5	1.498	1.366

In the first step of the sensitivity analysis, the Max PNV Benchmark was tested with the new base timber values and no price increases. This was done to model the greatest assumed difference between the assumptions of the EIS and alternate assumptions. The effect of these different sets of assumptions on suitable timber acres, PNV, and allowable sale quantity are shown in the following tabulation.

PNV Benchmark...	Suitable Timber Acres	PNV (Million $)	Long Term Sustained Yield (MMCF)
1) (EIS base values,'80 RPA)	730,580	298	17.3
2) (Test base values, no price increases)	619,840	52	12.9
Difference between 1) and 2)	-110,740 (15%)	-246 (83%)	-4.4 (25%)

Clearly, the changes in PNV are most significant, with less change occurring in the acreage suitable for timber management and in the timber that could be harvested over time. Though lands are still deemed economically suitable, the returns to the Treasury would be significantly less with alternate lower assumptions about base values and if no increases in timber values occur over time. The analysis also indicates the suitable timber base of the Preferred Alternative (Alternative S) is less than the acreage indicated to be economically suitable given both the initial and the test assumptions about timber economics.

In the next step of the sensitivity analysis, several iterations of one of the Alternatives displayed in the EIS (Alternative H) were tested using different assumptions about base values and price increases. These analysis are documented in the planning records. These analyses indicated several changes could be expected with alternative economic assumptions. First, they demonstrated PNV is sensitive to changes in assumptions about base values and price increases and that changes in PNV were always of greater magnitude than changes in acres suitable for timber management or in long term sustained yield. Second, allowable sale quantity was shown to also be sensitive in that harvest was deferred on lands costly to manage until discount factors/and price increases (in those analyses were they were assumed to occur) minimized losses. In one analysis, lands shown to be most costly in previous analyses (those over 45 percent in slope, requiring cable yarding systems) but in the suitable base were allowed to leave the timber base if the economic analysis indicated they were detrimental to an economically optimal solution given assumptions of lower base values and price increases. About a third of the acres, suitable and over 45 percent in slope, were deleted from the suitable timber base. This led to the conclusion that some lands were particularly sensitive to changes in assumptions about timber economics and that the economic efficiency associated with their management needs to be carefully monitored and assessed through implementation of the Forest Plan.

In the final step of the sensitivity analysis, the Preferred Alternative (Alternative S) was tested with the new base values and the 1985 RPA price increases. This analysis focused on the changes that might occur in the PNV and harvest schedules of the Preferred Alternative if alternate assumptions about timber economics were used. In one part of the analysis (II, below), the designations of the Preferred Alternative were not allowed to change because these designations provide the management intent of the Preferred Alternative, making it what it is. In the second part (III below), the land designations were allowed to change, permitting lands to leave the timber base if not contributing to economic optimization. The constraints regarding management activity scheduling were retained, with the exception of the constraint requiring harvest to be spread across the steep, over 45 percent lands, as well as the flatter ground. In the third part of the analysis (IV, below), the land designations were allowed to change, permitting lands to leave the timber base if not contributing to economic optimization. The constraints regarding management activity scheduling were retained, including the constraint requiring harvest on both steep and flat ground if that land was selected to be in the timber base. The effects associated with these different sets of assumptions on suitable timber acres, PNV, first decade allowable sale quantity (ASQ) and long term sustained yield (LTSY) are shown in the following tabulation.

Preferred Alternative...	Suitable Timber Acres	PNV (Million $)	LTSY (MMCF)	ASQ(MMCF) Decade I
Item I (EIS base values, 1980 RPA)	338,300	140	9.3	5.8
Item II (Test base values, 1985 RPA, no acres allowed to change)	338,300	53	8.2	5.8
Difference between I and II	not applicable	-87(62%)	-1.1 (12%)	N/A
Item III (Test base values, acres allowed to change, no +45 percent requirement	304,460	60	7.7	5.7
Difference between II and III	-33,840(10%)	+7(13%)	-.5 (6%)	-.1(2%)
Difference between I and III	-33,840(10%)	-80(57%)	-1.6(17%)	-.1(2%)
Item IV (Test base values, acres allowed to change, includes +45 percent requirement)	231,100	60	6.2	5.1
Difference between II and IV	-107,200(32%)	+7(13%)	-2.0(24%)	-.7(12%)
Difference between III and IV	- 73,360(24%)	no change	-1.5(19%)	-.6(11%)

As can be determined from the figures presented above, PNV can be enhanced with removal from the timber base of some of the acres included in the Preferred Alternative. The acres that left the timber base were acres in prescriptions that emphasized riparian value enhancement while scheduling timber management activities (18,000 acres), acres in prescriptions that highlighted wildlife and range values while scheduling timber harvest (about 10,000 acres), and acres where high intensity timber management would be scheduled (5,000 acres). All the lands over 45 percent in slope, where timber management is costly, are deferred to later decades (after decade 5) for management.

Evaluation of different sets of assumptions about timber base values and price increases facilitated understanding of the categories of land and types of management strategies which were most sensitive to the assumptions. The basic mathematical relationships of FORPLAN are sound, with the sensitivity analyses contributing to the knowledge required by management to make a decision regarding the Preferred Alternative.

b. **Range Benefits**

The value assigned to range forage reflects potential dollar returns from the range resource to the taxpayers even though only part of the price is actually collected by the Forest. The price is the net value to the rancher above the cash costs for grazing on the Forest. The value on the Forest is $8.53/AUM. (Gee, Economics Research Service,1981).

Because all forage outputs from the Forest are expected to be consumed, all forage outputs are priced. Receipts from the grazing program are fees paid by the permittee. The receipt value on the Forest is $1.43/AUM which is an average value for 1980-1984.

The value of the range program associated with minimum level benchmark is the value of the current program until allotments expire. The value in other benchmarks and alternatives is calculated by applying the appropriate price to the livestock forage schedule in FORPLAN.

c. Recreation/Wildlife Benefits

The value assigned to recreation reflects potential dollar returns from recreation to the taxpayers even though most dollar values are not actually collected by the Forest. The value is a "willingness to pay" value; that is what the recreationist would be willing to pay for the opportunity to use the National Forest at the point of entry to the Forest. The prices vary by type of experience and are expected to increase in the future. The values for the Forest are displayed in Table B-5.

Table B-5

Current and Future Prices for Recreation
(1978 Dollars, $/recreation visitor day)

	1985	1995	2005	2015	2025+
Big-game hunting	21.00	22.05	24.99	27.93	31.50
Other hunting	24.00	25.20	28.56	31.92	36.00
Wildlife viewing	29.00	30.45	34.51	38.57	43.50
Fishing	15.75	15.75	17.96	19.37	22.05
Wilderness	8.00	8.00	9.12	9.84	11.20
Other dispersed recreation	3.00	3.15	3.37	3.99	4.50

Source: FSM 1970 R-1, 1981.

Recreation use is projected to increase on the Forest as the population in Montana increases. Since recreation capacity exceeds use projections, recreation use rather than capacity is valued, i.e., the value of the recreation resource is based on expected use rather than capacity. The only exception to this is elk hunting. The amount and value of elk hunting is based on the potential size of the elk herd instead of the size of Montana's human population.

Receipts from developed recreation and special use programs consist of fees paid at campgrounds and fees paid for special uses. Fees are projected to continue at $5,800/year, which is the average value for 1981-84.

The value of recreation was calculated outside FORPLAN. With recreation use increasing as population increases all alternatives and benchmarks (except the minimum level benchmark) are expected to have the same increases in dispersed and wilderness recreation. This results in all alternatives and benchmarks having the same outputs for a given decade. An increasing but decade constant level of developed recreation is also used for all benchmarks and alternatives except minimum level. Net dispersed recreation values were included in the FORPLAN model as appended rows and columns and do affect prescription assignments.

Much of the recreation value is fixed for each decade, i.e., it is not a result of active management.

d. **Minerals Benefits**

Minerals benefits were not assigned values in the FORPLAN model because there is currently no reliable method of predicting undiscovered mineral values. Special use mineral receipts varied from $3,000 in 1981 to $11,000 in 1982. Mineral returns are also dependent on highly volatile National markets for both minerals and oil and gas commodities.

e. **Water**

No monetary value was assigned to water because most increases in water yield would occur in the spring when no excess water storage capacity is available.

C. **Non-Market Values**

Non-market values is the total qualitative value of all the resource uses or use opportunities whose value cannot be measured in dollars. Market transaction evidence is not available for these resource uses and therefore no basis exists for making dollar estimates that are comparable to the priced resource outputs, such as timber. Nonpriced outputs must be valued subjectively and descriptively. Generally, as the subjective value of the Beaverhead Forest's nonpriced outputs increases, the monetary value of the priced outputs as measured by PNV decreases. The magnitude of the monetary value foregone is measured and displayed as an opportunity cost. The values gained must be verbally described. "Net" subjective values implies that both nonpriced benefits and costs can occur.

The nonpriced resource uses or use opportunities in this analysis were identified from public involvement comments used to formulate public issues and management concerns (step I of the planning process) and from comments received on the 1982 Forest Plan DEIS. The following topics are considered the most important nonpriced values--Big game hunting quality, Water quality (including that associated with the fisheries values on Forest and downstream), Roadless resource management, Recreational settings and opportunities--quality and diversity, Visual quality of National Forest lands, Local economic stability, and Opportunities to maintain preferred lifestyles.

The nonpriced outputs identified above represent major items from the large and complex set of public benefits which exist (many of which are undefined). Those identified above help differentiate the environmental effects of the alternatives in that different levels of nonpriced resource outputs are produced in different alternatives by applying management prescriptions to specific areas and/or by applying output and inventory constraints. Any dollar costs associated with nonpriced outputs are included in PNV calculations. The responsiveness of an alternative to public concerns is a general measure of its non-market values.

2. Nonpriced Outputs

This section summarizes the major nonpriced outputs and value indicators, such as resource outputs or environmental impacts used to measure differences in alternatives' responsiveness to the nonpriced outputs. (See Table **B-15** in Section VIII of this Appendix for a display of how Alternatives respond to indicators of these nonpriced outputs). Public involvement leading to the definition of these nonpriced outputs is discussed in Appendix A.

a. Big game hunting quality

Calculations of PNV include "willingness to pay" values for hunting recreation visitor days as a proportion of total recreation visitor days. However, priced benefits include only values for an average hunting quality experience. High quality hunting experiences, often encountered on the Beaverhead, are an important nonpriced output.

Big game hunting quality indicators include number and type of hunting permits granted, length of the hunting season, diversity of hunting experiences available, and opportunities for a successful hunt. The first two factors are influenced by the relative security of big game habitat. Two of the manageable factors influencing habitat security are road access and available hiding cover. Each of the alternatives was examined to determine its effect on these factors. In addition, each alternative was evaluated for diversity of hunting experiences available and the opportunities that would be available for a successful hunt in terms of elk population potentials.

The PNV tradeoffs associated with this nonpriced output result from costs associated with road management, assignment of potential winter range to winter range prescriptions, and scheduling adjustments for timber harvest necessary to ensure adequate maintenance of hiding cover.

b. Water Quality

Water quality is a nonpriced benefit that is linked to several other resources and resource uses on the Beaverhead Forest and downstream. Forest streams contribute directly to several municipal watersheds and to other domestic water systems. In addition, outfitter camps, resorts, summer homes, and public recreation sites on National Forest land utilize Forest water. Highly significant recreational and fisheries values are associated with Forest streams and rivers whose headwaters are located within the Beaverhead Forest. Ranchers who use water from National Forest lands for irrigation are also concerned about water quality. Water quality can be impacted by use of Forest resources, including livestock grazing, road construction associated with timber harvest, timber harvest, and extraction of minerals or oil and gas.

The indicators of water quality are the amount of sediment in streams and the potential catchable trout populations. Alternatives were designed to maintain water quality with the State of Montana management requirements as a floor.

Water quality generally decreases as timber harvest and road construction increase, but improves with increases in roadless recreation or wilderness recommendations, and with increases in wildlife constraints limiting the amount and distribution of timber harvest. PNV generally decreases as water quality increases because of the restrictions imposed on priced benefits such as timber. In every Alternative, timber harvest activities will not occur if State of Montana Water Quality Standards cannot be met.

c. Roadless area management

A major issue on the Beaverhead is how to manage approximately 1,242,100 acres ofinventoried roadless areas, roughly 58 percent of the Forest. These areas are topographically and biologically diverse. While an average "willingness to pay" value has been assigned to dispersed and wilderness recreation opportunities, this value does not account for the total value of the exceptional quality of the wilderness and roadless resources on the National Forest. A variety of recreational activities have historically occurred in these areas. Some could continue with wilderness classification and others would not be allowed. These areas have value beyond their recreational uses; they provide wildlife habitat, function as biological reserves, serve as the headwaters for municipal watersheds or blue ribbon trout streams, and ensure that some areas of undeveloped country are maintained for future generations.

There are two primary components of this nonpriced benefit--wilderness management and roadless area management and the two are somewhat conflicting. Indicators of this value are the acres assigned to both; acres to be recommended for wilderness classification and acres to be managed as unroaded with generally a wider array of resource uses permitted. Alternatives were designed to explore a full range of options for management of the roadless resource, ranging from full development to unroaded recreation to custodial management (essentially unroaded) to wilderness classification.

The impact of this nonpriced benefit on PNV is generally negative due to the reduction in suitable timberland and the increased costs associated with recreation management.

d. Recreational settings--Quality and Diversity

The calculations of PNV account for the number of dispersed recreation opportunities but do not address quality and diversity. Providing a wide range of settings varying in the level of development, user density, and mode of access ensures that the broadest segment of the public will find quality recreational experiences both now and in the future. Also, certain environmental settings have a high potential for providing quality recreational experiences. Certain landform types, vegetative types, scenery, water, and wildlife are factors that can contribute to the quality of the recreation setting. Finally, certain areas have long established historical uses that could be impacted depending upon the selected land use.

The alternatives were analyzed with respect to the quality and variety of the lands managed to provide recreation opportunities. Areas where public comments have indicated interest in maintaining a particular type of recreational opportunity were examined for each alternative. Areas of particular interest include the West Big Hole, West Pioneers, East Pioneers, Tobacco Root Mountains and Snowcrest Mountains. Each alternative was evaluated to assess its impacts on these areas.

e. Visual Quality

Visual management constrains timber management options, thereby contributing to increased costs and reduced PNV. Visual quality benefits are not included in PNV. Therefore, visual management objectives associated with the selected prescriptions for each alternative are evaluated in terms of their contribution to net public benefits.

f. Mineral Activity

Minerals were not assigned dollar values because there is currently no reliable method of predicting undiscovered mineral values. However, the Beaverhead is an area of high mineral interest for both energy and nonenergy minerals. Evidence of this is provided by the tripling of mineral receipts from 1981-1982 and by the amount of exploration activity presently occurring. Each alternative is evaluated in terms of the constraints imposed on access for mineral exploration and development, with consideration given to the favorability rating for specific areas.

g. Local Economic Stability

The value of maintaining or increasing local economic stability is not included in PNV. Maintenance of a sustained flow of Forest resources and uses to local communities decreases PNV because management options are decreased. In fact, the production of adequate levels of certain resources that contribute to the local economy may not be economically efficient.

Economic stability implies a dynamic, diverse, orderly, changing, and growing economy. The degree to which the production of goods and services associated with each alternative is responsive to the evolving local economy is assesssed in the calculations of this nonpriced value. The variety and volume of goods and services contribute to local economic stability and the indicator used to measure each alternative are impacts on the employment and income opportunities in the local, multicounty, impact area.

h. Lifestyles

The opportunities for local people to maintain existing and desired lifestyles are not valued as priced benefits or calculated in PNV but are considered in the determination of non-market values. Local people depend on the Forest's resources in many ways; they have established relationships with the Beaverhead Forest. Thus the variety and quantity of resource uses available to people can impact their abilities to maintain a chosen lifestyle. Alternatives are evaluated in terms of the degree of shift that could occur in established land use patterns and relationships with National Forest resources.

V. Social and Economic Impact Analysis

A. Overview

Social and socioeconomic impact analyses estimate the relationship that has evolved over time between National Forest management activities and policies and people. Short-term impacts generally generate the most interest and concerns; however, long-term effects (over 10 years) must also be evaluated in any analysis of the impacts of Forest management alternatives on people. The social and socioeconomic analyses focus on people's lifestyles, land use patterns, and attitudes, beliefs, and values regarding National Forest management as well as on local employment and income opportunities, and state revenues.

B. Social measures

Social impact analysis estimates how National Forest policies and actions affect the quality of life of a specified population. Future social and cultural conditions associated with continuation of current management direction are compared with the likely results of implementation of other management alternatives.

Social impacts were measured by evaluating focusing on social variables and social groups within three main zones of influence. The zones of influence included a primary or local zone (Beaverhead and Madision Counties) wherein residents are most directly affected by resource management activities and decisions on the Beaverhead NF. Also included were a regional zone (generally counties in southwestern Montana on both sides of the Continental Divide and counties in Idaho that border this area of Montana). The third zone of influence was a national zone, recognizing the nation-wide interest in some of the resources of the Beaverhead NF.

Social variables are measures that define how people are affected by their natural environment and how they interact with it. Social groups are those affected by Forest Service activities and are developed to reflect differences in effects not necessarily existing social organizations or groups.

A social assessment (1981) examined the interrelationships of all these factors with reference to the current situation and the potential of continuing current direction.

1. Beaverhead National Forest Zone of Influence

The Beaverhead National Forest primary zone of influence is Madison and Beaverhead Counties. The people most likely to be directly affected by Forest activities live here. Population in Beaverhead County has been relatively stable during the last ten years, increasing from 8,187 in 1970 to 8,204 in 1980 (a .21 percent increase). Population in Madison County has grown moderately, from 5,014 in 1970 to 5,437 in 1980 (8.44 percent increase). The agriculture industry dominates employment followed by employment in tourism and travel, government, lumber industries, and to a lesser extent mining and manufacturing.

Certainly there are differences between people within this primary zone but for the purposes of this assessment, differences can be explained by the social (categorical) groupings.

2. Social Variables

The social variables used in the social assessment for the Beaverhead National Forest (1981) are displayed below.

a. Sense of control/self-sufficiency

This variable refers to the feeling and/or belief that one has control over one's life direction; is not subject to control by others, such as outside or government interference; and has a sense of freedom in one's life. Many people feel that their ability to control their own destinies is directly associated with their ability to control decisions influencing their lives.

This variable is important to land management planning in the Beaverhead because all social groups are concerned over this issue. People often view the lack of local control as a major social issue in their communities. People often indicated that policies dictated from "higher up" tended to be a major source of irritation. Many programs are often seen as being dictated from Washington, and local control over such programs or proposals is often viewed as being limited or nonexistent.

This important social variable also refers to not having to rely on others; living one's life in one's own way; and having the ability and native skills to use whatever resources are necessary to get along without any, or a minimum of, outside help. Ranchers, loggers and miners in the primary zone of influence are good examples of people who are, and want to remain, self-sufficient and in control of their lives.

b. Certainty/Uncertainty

This variable refers to the probability that there are certain things that can be counted on. As far as the resources are concerned, it refers to the lack of confidence (uncertainty) people may have about being able to stay in a community because of the changes in use of resources, or because the resources are in limited supply. Ranchers, loggers, miners, guides and outfitters, and some recreational businesses are dependent upon the resources for their livelihood and are, therefore, very concerned about this aspect of the certainty/uncertainty variable. A decrease of change in existing land use can greatly diminish the degree of certainty these people have about their job/income and the prospects of living at their present locations. On the other hand, a sufficient supply of the natural resources would indicate a greater degree of certainty about the future. Loggers who have a sufficient supply of logs, miners with sufficient minerals, and recreationists with sufficient recreational opportunities are all viewed as having a measure of certainty about their future as it relates to the resources.

c. Community Cohesion/Stability

Community cohesion refers to a sense of loyalty to and interpersonal cooperation within a community. This includes such things as adhering to the beliefs and goals of the community and to participation in community activities; i.e., working together on projects for the betterment of the community, neighbors helping one another in time of need, etc. Additionally, community cohesion refers to a sense of importance of "belonging" in one community as opposed to another, and the importance of living near others who have similar interests and values.

A lessening of community cohesion can occur with issues that partition communities into warring factions, decreasing community unification. One such issue of local, regional, and national interest is the classification of certain land areas as either wilderness or nonwilderness. Groups often become polarized over the development/amenity dichotomy. Government organizations (like the Beaverhead NF) are often in the middle of this type of conflict.

d. Population Change/Crowding

This factor refers to the number of people who can comfortably fit into a defined geographical area. In numerical terms, it signifies the rate of decline or growth in the population.

"Too many" people refers not only to the number of, but also to the kinds of people who may move into the area. A "few" different people are seen as too many, while a larger number of people "like the locals" may be perceived as being acceptable. Many different people could also change the demand on how the Forest is managed.

The prospects of having more people move into the area is a concern of nearly all of the local people. While the current population is perceived as acceptable or sufficient, the possibility of a further increase in the numbers of people in the next 5 to 10 years has a negative impact on those (a majority) who feel more people means overcrowding and a positive impact on those who feel more people are needed in the area.

This variable also refers to the numbers and types of people one sees when he/she is away from home in a more natural setting. Additionally, a subcomponent of this factor is the satisfaction one perceives in the apparent change in the number of people one sees in the natural setting.

e. Lifestyle and Job Dependence

This concept refers to using the Forest resources to maintain a way of living that is financially dependent upon a particular resource-related occupation (i.e., logging, ranching, mining, recreational businesses, etc.). Ranching and related jobs are a major concern on the Beaverhead National Forest, although some individuals are engaged in mining and timber-related occupations. Without the resources, these people would have a difficult time maintaining their preferred lifestyle. It might be possible for people to move to a new area where the occupation/lifestyle could be perpetuated, but such a move is not likely to be desired.

Many other activities in which people frequently participate, such as hunting, fishing, backpacking, picnicking, berrypicking, etc., are an important aspect of many people's lifestyles, although economic dependence is not a factor.

f. Symbolic Meaning

This refers to the emotional and cognitive attachment one has for the places and resources on, or from, the Forests. The "scenic beauty" aspect of this construct pleases or satisfies the senses and/or perceived psychological needs. The line, color, form, texture, and proportion of landscape affects the aesthetic value system. Additionally, geographic areas, along with objects, are significant for certain religious activities; i.e., sacred mountains, vision quest sites, petroglyphics, etc. The recreational aspect refers to the attachment of the resources for some form of play, amusement, or relaxation.

People regionally or nationally often perceive or use the Forest on a symbolic level. Although they are not economically dependent upon the Beaverhead, they receive rational/psychological benefit from resources. Fishing the Madison, backpacking into the Tobacco Roots, or skiing at Maverick Mountain provides an important outlet for people, locally, regionally and nationally.

g. Number of Jobs

This refers to the numbers of jobs in a particular occupation, (i.e., logging, recreation, etc.) or area (i.e., Lima, Dewey, Madison County, etc.).

h. Economic Stability

This variable refers to relatively constant, but steady, numbers of jobs, income, and types of jobs/income for the local impact area. The amount of income could remain constant (or increase) as projected for any given year, but a change in proposed land uses could change the numbers of jobs or amount of money earned in separate components and thereby upset the stability of certain groups. For example, a change from timber emphasis to recreation emphasis may result in an overall similar income for a specific geographic area, but loggers, in this case, would be negatively impacted, while those in the recreation business would be positively influenced.

3. Social Groups

The social groups used in the social assessment are displayed below. Of course, there are many other groupings and subgroups of the groups presented below which also could be evaluated. However, it was impossible to analyze all possible categories of people. The following comments are generalizations (Note: not all individuals are covered by the generalization).

a. Younger Newcomers

Younger newcomers (or in some cases "just" newcomers) are not viewed as a major category in terms of numbers. However, they represent an important group, because they are often different in outlook from many of the other groups. Some are river guide/outfitters who operate on the Madison River, Beaverhead

River, and/or the Big Hole River. Others operate small businesses or find work in teaching, government, construction, etc.

These people are seen as having come to mainly the Dillon, Virginia City, and Ennis areas from California, Colorado, the Midwest, etc. Because of their background differences, they are not always easily assimilated into the local culture which is rather traditional and conservative.

Newcomers are likely to be more environmentally oriented than those already established in the area. This can cause conflict, since the newcomers often are more vocal in stating their opinions than are the locals. Conflict has arisen between newcomers and ranchers, miners, millworkers/laborers over wilderness issues (West Big Hole, Pioneers, etc.). The conflict is much more pronounced in Beaverhead County than it is in Madison County (especially the Madison Valley), although some conflict exists throughout the primary zone of influence.

b. Millworkers/Laborers

The people of this category tend to be somewhat heterogeneous. Since the beauty of the area attracts people from the outside who will take any job, people with diverse backgrounds are found working side-by-side.

Some area residents see the typical millworker/laborer as being a person who enjoys the resources from a consumptive attitude. That is, he/she enjoys using the resources in work and, if possible, in play. For recreational purposes, those with a consumptive viewpoint focus on getting the game, fish, or berries, etc., while those with a nonconsumptive viewpoint would be more interested in the experience than in the "meat". Consumptive people are often viewed as using the Forest for nearly all of their recreational activities, while nonconsumptivepeople are seen as having other outside interests, i.e., golf, handball, jogging, tennis, etc.

Most people in this category work in talc mines or the wood products industry and live in the Ennis area, Sheridan/Alder/Virginia City area, or the Dillon area.

c. Ranchers/Farmers

Ranchers of the area are viewed as being quite capable and respected people. They are involved in many activities and are seen as being very influential in local and state politics.

Most area ranchers/farmers tend to have a value system greatly influenced by the pioneers/settlers of the West. In fact, many of these people are third-or fourth-generation descendents of the original landowners of the area. This is especially true of ranchers from the Big Hole, Dillon, and Ruby Valley areas, but not the upper Madison Valley. Ranchers are likely to be conservative and independent, show concern for neighbors, respect the land, and have a strong desire to maintain their independence. Because of high taxes and overhead and low or unstable prices for livestock/crops, there is an increasing temptation to sell out or subdivide.

Nontraditional and absentee owners may have diverse land use philosophies depending on the recreational value placed upon the land. Instead of an exploitation (of resources) philosophy, many see the land as a source of diversified enjoyment--the pleasure of owning and working it, of hunting, fishing, and snowmobiling on it, of just relaxing and enjoying it.

Some people interviewed believe that traditional farmers/ranchers enjoy the battle with nature. That is, they like the challenge offered by dealing with weather, crops, animals, and other difficult and unpredictable vicissitudes of the occupation/life. The overcoming of odds under such circumstances presents them with much satisfaction and is sufficient reward and enough incentive to "hang on" during tough (economic) times.

The ranching influence, i.e., clothing, values, manner of speech, etc., is an important part of the life of Madison and Beaverhead Counties. Many decry the development or possible development of ranches into subdivisions of smaller parcels of land, since the traditional ownership of larger "spreads" tends to perpetuate the ranching lifestyle which is ingrained in local society.

Corporate owners and wealthy nontraditional owners (those who made their money in other pursuits, but may be looking for some tax advantages from ranch ownership) may have a completely different orientation to life than typical ranchers of the primary zone of influence.

d. **Loggers**

Loggers have accepted the seasonality of the industry as a way of life. Layoffs and downtimes are part of the woodworker's life. These people often travel great distances to work, putting in long hours of work and driving/riding time. The love of the work out-of-doors, necessity of working, and the chance to be one's own boss are some reasons that the workers are willing to put forth such an investment in time away from home. In some cases, the seasonality of employment is often sought because of the amount of recreational time that is available to the woodworkers or because of other jobs (ranching, mining, etc.). Recreational pursuits include fishing, hunting, "four-wheeling", snowmobiling, motorbiking, etc. Almost all loggers are involved in some of the various recreational activities that are pursuant to the timbered mountains of the West.

Values of the woodworkers appear to be consistent with the traditional western type individual--independence, toughness, concern for neighbors, and desire to control the future. Local control is a real issue. They tend to feel very strongly against classifying forest land as wilderness. This action is seen as outside influence, influencing the possibilities of jobs and ways of life. In some cases, the timber industry has become a symbolic value which underscores the economic importance. Symbolic meaning supports the idea that the way of life is often more important than the monetary remuneration of an occupation. Consequently, any resource decisions which affect the woodworker's life and economic sustenance will likely be met with strong, vociferous resistance, although historically, these people have been slow to organize.

e. Business People

This group is viewed as a major group by nearly all those interviewed. Business people are seen as those who are interested in community affairs and involved in the political process. They are seen as influential people who have strong community ties. Many are considered to be conservative and independent. This would especially be true of business people from Sheridan, Twin Bridges, Lima, the Big Hole area, most of Dillon, etc.

Business people in this area are generally considered to be more consumptively oriented than environmentally inclined. This would not be true of many business people involved in recreational-oriented enterprises in Dillon, the Elkhorn area, Madison Valley, etc., or some small shop owners (usually newcomers) in the Dillon, Virginia City, and Ennis areas.

f. Miners

Miners are seen as being similar to people in the labor force in an urban area and as a hard-living/hard-working group. Miners are considered to be independent and desiring to take care of themselves.

They are forthright people and do not use a lot of fancy words and euphemisms; they tell you what is on their minds. Interviewees also felt that they, like millworkers/laborers, enjoy the resource from more of a consumptive approach than an amenities view.

However, even though they may dig up a mountain to obtain ore, some of those interviewed believe that miners are concerned about the quality of the environment. They are only doing what they have to do to make a living. Miners are located throughout the local area with some concentration of them in Argenta, Dillon, Sheridan, Twin Bridges, Virginia City, Ennis and Wise River.

g. Government Workers/Educators

This category of people include Federal, State, County, and local government workers, and school teachers.

These people are viewed as being more environmentally oriented than most other groups. This, of course, varies with different individuals, but especially applies to newcomers in the Dillon area, Madison Valley, and Virginia City.

h. Retired

This varied group consists of people from many walks of life. The interests and values of this group depend upon former areas of residence, occupation, etc. Because of their station in life, they are often interested in amenity values, especially fishing, camping, viewing scenery, etc.

Those who move from other areas are usually attracted due to the recreational opportunities in the area. Most of the retired are located in the Wise River area, Dillon, Elkhorn area, Sheridan, Twin Bridges, or the Madison Valley.

4. Social Analysis Process

Information for the social assessment of the present situation was obtained from a number of sources using several data collection techniques. Information was gathered from local residents and Forest Service employees through unstructured interviews; previous social assessments from other agencies and projects were reviewed; demographic information from the 1980 Census; letters sent by constituents on the Beaverhead NF planning effort were systematically reviewed for relevant comments; and a questionnaire was developed and completed by Forest Service personnel to ascertain the relative values for the social variables. This information is summarized in the following section (for more details see the Forest Planning Records, "Social Assessment of the Present Situation and Social Analysis of the No Action Alternative",1981).

5. Findings

While it is difficult to summarize the findings of the social assessment, it is relatively easy to note that different groups of people will experience the impacts of the management alternatives in distinct ways. What is perceived as an adverse impact by one group may be seen as a positive impact by another group. Generally, those who view or utilize the Beaverhead NF and its associated resource from an amenity standpoint--such as recreationists, fishermen, hunters, backpackers, and so on--will benefit from the more amenity oriented alternatives. Conversely, those who advocate or use the commodity resources, such as timber, minerals, and to some extent range, will be positively affected by the commodity alternatives.

The people of the primary zone of influence believe that it is important to be as free as possible from outside forces with as much control over their activities and future as possible. They resist government interference; they support local control which they can influence while opposing legislation and regulations "handed down to them" from the federal or even State levels. They like the relatively homogeneous groupings and uncrowded conditions characteristic of the current situation and would resist a sudden influx of "newcomers" who were different from them. Local people do not believe that anyone from outside the area has a right to tell them what to do. This includes external influences on the management of the Beaverhead NF--management should be responsive to local needs not the concerns of nonlocals.

Community cohesion is very important and resource decisions that would be a major shift from the current situation, cause an influx of new people, or lead to polarization of local residents will weaken community cohesion and adversely impact something held to be important by residents.

People enjoy living and working in a beautiful natural environment with an abundance of recreational opportunities. Generally people want opportunities to remain as they are. People who depend on natural resources for a living (loggers, miners, ranchers, outfitters) indicate that it is particularly important that there is and will continue to be a supply of resouce outputs available to them.

C. Socioeconomic Impact Model

An input-output model (IMPLAN) was used to estimate the employment and income impacts of Forest outputs and activities. Direct, indirect, induced, and total impacts were calculated.

Economic input-output (I-0) analysis is a procedure for describing the structural interdependence of a regional economy or impact area and serves as a short-term predictive model for evaluating the impacts of shifts in Forest outputs and activities.

I-0 analysis is based upon the interdependence of production and consumption sectors in the impact area. Industries must purchase inputs from other industries, as well as primary sources like natural resources, for use in the production of outputs which are sold either to other industries or to final consumers.

Flows of industrial inputs can be traced via the I-0 accounts to show linkage among the industries in the economy. The accounts are also transformed into a set of simultaneous equations that permit the prediction of economic effects resulting from changes in Forest outputs and activities.

I-0 analysis is based on assumptions that limit the accuracy of projections. Therefore, the numbers presented are relative indicators rather than absolute projections.

1. Local Impact Area

The Forest's impact area is Beaverhead, Silverbow, Deer Lodge, and Madison Counties in Montana.

2. IMPLAN Data Base

The I-0 model data base consists of (1) a national level technology matrix and;(2) a county-by-county file of estimated activity levels for total gross output, six components of final demand, three components of final payments and employment for 466 industrial/business sectors. (See USDA Forest Service, 1983 for more information on the I-0 model.)

The national technology matrix is based on a 1972 Commerce Department I-0 model converted to an industry by industry basis and updated to 1977 using the RAS procedure (Clopper and others, 1974). The county level information is based on a 1977 data set constructed by Engineering Economics Associates of Berkeley, California.

Utilizing the national technology matrix and the regional control totals for the local impact area, a data reduction method was used to develop a regional input-output table. The method uses the property of "openness" displayed by regional economies compared with the national economy (Richardson, 1972). Smaller regional economies exhibit much greater tendencies or are more open to import and export than is observed at the national level. Based on the assumption that trade balances are the principal difference between national and regional purchase patterns, the supply-demand pool technique for data reduction was adopted (Schaffer and Chu, 1969).

3. **Final Demand Expenditures**

The I-0 model translates Forest outputs and activities into employment and income impacts. An intermediate step is the translation of outputs into final demand dollars. Final demand expenditures are different from the values used in the efficiency analysis. Final demand expenditures represent the dollars spent by the final consumers of the finished products derived from Forest outputs. For instance, timber is processed into lumber which has a sale value at the mill. The sale value represents the amount of new money that will be directly generated for the local impact area--assuming that most is sold outside the impact area, this causes the local impact. The efficiency analysis examines only stumpage or the market value of the raw material that leaves the Forest.

This modeling step is accomplished by applying a final demand expenditure per unit of output to total outputs and linking the resulting dollar amount to the sectors in which the direct expenditure takes place. This process determines the change that takes place in the existing economy. Expenditure information is contained in the planning records.

D. Base Year, Alternative and Benchmark Employment and Income Information

Forest outputs for 1980 were identified and analyzed with the I-0 model to provide a base situation from which private sector employoment and income changes could be measured (Private sector employment includes ranchers, local industry, retail trade and other non-government employers). Table **B-6** contains 1980 outputs levels, employment and income amounts associated with 1980 outputs, and the job and income coefficients per unit of output. Table **B-7** shows employment and income for alternatives and benchmarks.

Table B-6
Forest Outputs and Impacts in 1980

Output	1980 Production	Employment Direct Jobs	Total Jobs	Jobs/Unit	Income Direct M$	Total M$	Income M$ per Unit
Softwood sawtimber	21.6 MBF	91	276	12.8/MMBF	2422	5972	$276/MMBF
Picknicking	11.2 MRVD	4	6	0.5/MRVD	49	86	$ 8/MRVD
Camping	87.9 MRVD	7	12	0.1/MRVD	101	177	$ 2/MRVD
Skiing	44.6 MRVD	89	142	3.2/MRVD	989	1872	$ 42/MRVD
Water-based recreation	134.7 MRVD	30	48	0.4/MRVD	359	673	$ 5/MRVD
Dispersed nonmotorized recreation	51.4 MRVD	26	42	0.8/MRVD	291	564	$ 11/MRVD
Dispersed motorized recreation	55.8 MRVD	29	47	0.8/MRVD	312	201	$ 4/MRVD
Big-game hunting	49.2 MRVD	40	64	1.3/MRVD	503	906	$ 18/MRVD
Small-game hunting	15.2 MRVD	5	8	0.6/MRVD	64	100	$ 7/MRVD
Nongame wildlife	6.4 MRVD	3	4	0.7/MRVD	26	46	$ 7/MRVD
Fishing	48.7 MRVD	11	17	0.4/MRVD	128	239	$ 5/MRVD
Cattle	175.4 MAUM	29	126	0.8/MAUM	686	2543	$ 15/MAUM
Sheep	14.6 MAUM	7	31	2.1/MAUM	169	622	$ 43/MAUM
Forest operations maintenance and capital investment	1.19 MM$	14	25	21.0/MM$	263	453	$380/MM$
Forest salaries	2.21 MM$	40	66	29.9/MM$	616	1227	$555/MM$
Total		326	914		6983	15691	

Table B-7
Total Forest-Related Employment and Income for Alternatives and Benchmarks

	Jobs		Income (MM$)	
	Decade 1	Decade 3	Decade 1	Decade 3
Alternatives				
A	1072	1329	19	23
B	1135	1535	20	28
C	1053	1417	18	25
D	930	1096	16	18
F	1180	1344	21	23
G	1266	1441	23	26
H	973	1153	16	19
H(dept)	1121	1352	20	24
H(A)	1018	1202	17	20
I	1041	1219	18	21
W	1201	1364	22	24
S	928	1183	16	20
S(A)	938	1197	16	20
Benchmarks				
Current Direction	1190	1308	22	23
Max Range	1704	2166	33	41
Max PNV	1411	1600	26	29
Min Level	620	234	10	3
Max Wildlife	1388	1647	26	30
Max Timber	1441	1645	27	30
Max Wilderness	1041	1219	18	21

E. Returns To U.S. Treasury

Each alternative provides revenue to the U.S. Treasury, generated from several sources: timber sale receipts, domestic livestock grazing fees, developed site users fees, special use permit receipts, and mineral (oil and gas, primarily) leasing fees. The bulk of the revenue is associated with the timber and grazing programs. Table B-8 displays the returns to the U.S. Treasury for the alternatives and some benchmarks in decades 1, 3, and 5.

Table B-8

	Returns to the U.S. Treasury (M$/yr)		
	decade 1	decade 3	decade 5
Alternatives			
A	5664	9042	11141
B	5327	10854	20778
C	3300	8882	17824
D	3850	4291	5917
F	6890	8071	10887
G	7122	11489	18758
H	3560	5272	11932
H(dept)	4175	7219	12907
H(A)	3972	5988	13173
I	4521	7253	12082
W	7202	8262	11719
S	2383	821	8070
S(A)	2476	6020	8552
Benchmarks			
Current Direction	6121	8055	8657
Max PNV	9344	14142	24420
Min Level	225	19	19
Max Timber	6085	10122	16639
Max Wilderness	4521	7253	12082

F. Returns To Local Governments

The federal treasury returns 25 percent of the receipts generated through management of National Forest System lands to the States and Counties in which the federal lands are located. Table **B-9** displays the returns to States for each of the alternatives and some benchmarks in decades 1, 3, and 5.

Table B-9

Returns to the States (M$/yr)	decade 1	decade 3	decade 5
Alternatives			
A	1416	2261	2785
B	1332	2714	5194
C	825	2221	4456
D	962	1073	1479
F	1722	2018	2722
G	1780	2872	4689
H	890	1318	2983
H(dept)	1044	1805	3227
HA	993	1497	3293
I	1130	1813	3021
W	1800	2065	2930
S	596	1455	2018
S(A)	619	1505	2138
Benchmarks			
Current Direction	1530	2014	2164
Max PNV	2336	3536	6105
Min Level	56	5	5
Timber	1521	2530	4160
Max Wilderness	1130	1813	3021

G. **Forest Workforce**

The workforce needed for management of the Beaverhead National Forest varies directly with the average annual budget and production levels associated with significant resources. Table **B-10** shows the Forest work force needed under each alternative for decades 1, 3, and 5.

Table B-10

	Beaverhead NF Workforce		
	decade 1	decade 3	decade 5
Alternatives			
A	161	163	165
B	158	171	171
C	154	167	169
D	153	153	156
F	166	166	169
G	161	162	167
H	159	159	161
H(dept)	161	163	165
HA	163	163	165
I	158	158	161
W	167	167	169
S	155	158	158
SA	156	159	159

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VI. Analysis Prior to Development of Alternatives

A. Introduction

The primary analysis prior to developing alternatives was the analysis of the management situation(AMS)--a determination of the ability of the Forest to supply goods and services in response to society's demands. This analysis provided a basis for formulating a broad range of reasonable alternatives by examining the following:

- Benchmark analyses
  - The minimum level of management with associated costs and benefits.
  - The maximum physical and biological production potentials of single resources as well as sets of resources together with their associated costs and benefits.
  - The maximum present net value of resources with an established market value or an assigned value (a cost efficiency measure).
  - A point of reference was also defined from which the costs and effects of constraints were measured.
- Analysis of the current and expected future level of goods and services if current management direction continued.
- Projections of demand for goods and services.
- Analysis of the potential to resolve issues and concerns.
- Analysis of the need to change management direction.

The results of this analysis form the framework within which alternatives were developed.

B. Development of Minimum Management Requirements (MMR)

The minimum management requirements in 36 CFR 219.27 are as follows:

1. Conserve soil and water resources.
2. Minimize hazards from flood, wind, wildlife, erosion, and other natural physical forces.
3. Reduce hazards from pest organisms.
4. Protect riparian zones.
5. Provide diversity.
6. Provide fish and wildlife habitat to maintain viable populations.
7. Adhere to multiple use laws.
8. Protect threatened and endangered species habitat.
9. Provide for rights-of-way and corridors.
10. Develop road construction standards.
11. Revegetate temporary roads.
12. Maintain air quality.
13. Reforest in 5 years.
14. Limit openings to 40 acres.

The methods used to meet these minimum management requirements include:

- Developing standards and guidelines and appropriate practices for management prescriptions.
- Assignment of management prescriptions and intensities to analysis areas in FORPLAN.
- Applying access, scheduled output and inventory constraints to analysis areas or groups of analysis areas in FORPLAN. Constraints are applied in FORPLAN such that a single more restrictive constraint may accomplish it's objective and in doing so also meet what several other less restrictive constraints are intended to accomplish. If this is the case, the less restrictive constraints are not influencing prescription selection and no compounding or "over constraining" takes place.

1. **Conserve Soil and Water Resources**

Two of the most significant impacts to soil and water resources are road construction and timber harvest. The amount of road construction varied by slope and aspect. Forest engineering experience on the Beaverhead NF has demonstrated that on slopes over 45 percent, full bench construction is necessary for stability and wider roads are necessary to accommodate cable yarders. On north aspects road ditches are needed to handle snow melt and runoff, where on south slopes outsloping is generally adequate. Seeding cut and fill slopes is neccessary on all new road construction for soil stability. These standards influence road construction costs in the economics tables (assumed the same for all alternatives and benchmarks).

Road densities also vary with spacings on tractor ground (less than 45 percent) of 1500-2000 feet. On cable ground (greater than 45 percent) road spacings are 1200-1500 feet to accommodate medium range yarders. The road densities are the same for all alternatives and benchmarks.

FORPLAN Model constraints for timber harvest were developed by estimating the impact on watershed values. Two primary assumptions were used. First, it was estimated that as much as 10 percent of a drainage can be harvested in one decade without damage to the watershed. Second, approximately 50 percent of the Beaverhead NF is potentially suitable for regulated timber harvest; thus at most half of the National Forest land would be harvested through the Planning horizon. Based on these assumptions, constraints were developed that allowed no more than 20 percent of a planning unit (ie. Fleecers) to be harvested in any decade. The distribution of existing stands in combination with this constraint precluded excessive harvest in any single decade, thereby protecting the watershed.

These constraints were incorporated in the Max PNV benchmark increment 3 (102 BMA) and in PNV increment 4 (LMPBE2). For sensitivity analysis they were dropped from PNV increment 5 (LMPBE1). Without the constraints, the annual timber harvest more than doubled in decade 1 (114 MMBF to 299 MMBF). The Max Timber benchmark increment 5 (102 TMA), the Max Range benchmark (102 RGB), and increment 1 of the maxmimum range benchmark (102 RGA) also used the same area constraints to protect soil and water resources. Max Timber increment 2 (102 MTB) did not.

All of the other benchmarks and alternatives used a nondeclining flow model constraint. The nondeclining flow constraint protects the soil and water resource since it spreads harvest out over the length of the rotation, in this case from 90 years to in excess of 120. Since a 100-year rotation would result in 10 percent harvest by decade, the nondeclining yield is more restrictive than the 20 percent constraint used in the other benchmarks.

In addition to model constraints, management prescription standards and guidelines include measures to protect soil and water resources. For example, in all range prescriptions, 35 percent of the available forage is retained for plant vigor and watershed protection. All riparian timber prescriptions require selection harvest and cable logging systems. Selection harvest and cable logging is also required in the "S" working groups, which are areas of high water tables, sensitive soils, and spruce-fir timber types. Site preparation and slash disposal techniques vary as the perscription is applied to different slope classes. For slopes less than 45 percent dozer piling is used, for slopes greater than 45 percent broadcast burning is used. In all prescriptions 10-15 tons per acre of slash will be left on the site for soil productivity.

2. Minimize hazards from flood, wind, wildfire, erosion, and other natural physical forces.

The soil and water MMR discussed previously outlines the standards, guidelines, assignments, and constraints needed to minimize hazards from harvest fuels, flood, and erosion.

Wind can cause unnecessary damage to residual trees in timber sale areas if improper silvicultural systems are applied. This hazard is minimized by prescribing silviculturally sound systems by working group and timber type.

To minimize the hazards of wildfire, adequate fire suppression funds are included in prescription costs, and proper slash disposal techniques are included in timber prescriptions.

3. Reduce Hazards from Pest Organisms

Trees on the Forest are susceptible to mountain pine beetle, spruce budworm, dwarf mistletoe, and other pest organisms. Rather than let the natural process create favorable conditions for these pest organisms, several different management practices were considered to help prevent hazards from pest organisms.

Clearcutting is used in lodgepole pine types except in riparian areas and "S" working groups. Group selections are used in these areas. Clearcutting will help prevent the spread of diseases such as dwarf mistletoe. Harvest of the regenerated stand is allowed as early as age 90 to reduce potential for mountain pine beetle epidemics in managed stands. This MMR is linked to the NFMA regulations CFR 36 219.16(a)(2)(iii)... "Alternatives which incorporate exceptions to these [CMAI] standards shall be evaluated if it is reasonable to expect that overall multiple-use objectives would be better attained. Alternatives which incorporate exceptions ... are permitted for the use of sound silvicultural practices... or for removing particular species of trees after consideration has been given to the multiple uses of the area being planned and after completion of the public participation process applicable to the preparation of a forest plan." The susceptibility of lodgepole pine stands to mountain pine beetle on the Beaverhead indicates the need for harvest prior to CMAI; roughly 25 percent of the stands are harvested prior to CMAI in the FORPLAN analysis.

The even-aged management systems of clearcutting and shelterwood harvesting are used in the mixed conifer timber types as well to reduce dwarf mistletoe infestations. These even-age systems are used in all working groups except riparian and "S" working groups where selection and group selection systems are used.

Standards and guidelines for prescriptions provide for planting a mixture of species where possible to enhance species diversity and reduce potential for insect and disease damage.

4. Protect Riparian Zones

Riparian prescriptions were developed specifically to protect riparian zones. Timber harvest is limited to selection or group selection systems using cable logging to minimize disturbance. Livestock utilization is limited to 35 percent to protect streambank stability and riparian vegetation. Only riparian prescriptions were available for selection in riparian analysis areas. These prescriptions included a choice of timber or nontimber treatments. In addition, prescription standards and guidelines provide direction for protection of riparian zones.

Roads constructed within the riparian area can significantly affect water quality, stream channels, and fish habitat. The management prescriptions contain standards and guidelines for roading in riparian areas. The main objective of this standard and guideline is to utilize transportation system planning to minimize stream crossings and avoid locating roads that parallel streams in riparian areas.

5. Diversity

The existing age-class distribution of trees on the Beaverhead NF includes a preponderance of old growth habitat, usually the habitat most sensitive to timber harvest activities. Roughly 405,200 of the 2,100,000 acres of the Beaverhead NF are classified as old growth habitat. Riparian prescriptions, recreation management areas, and classified and recommended wildernesses will ensure prepetuation of the old growth habitat component over time. Adequate forest diversity will be provided because of the amount of wilderness and recommended wilderness on the Beaverhead and because of the distribution of harvest over time (See soil, water and riparian MMR's) and the forested areas not assigned timber management prescriptions.

6. Adequate Fish and Wildlife Habitat to Maintain Viable Populations

One or more selected indicator species are used to represent fish or wildlife species that have similiar biological requirements. Indicator species for the Beaverhead NF are peregrine falcon, gray wolf, and bald eagle as endangered species; grizzly bear as the threatened species on the Forest; Rocky Mountain elk, representative of a species commonly hunted; sage grouse representing the sagebrush ecosystem, the goshawk representing the old-growth Douglas fir habitats, the pine marten representing the old-growth spruce/fir, the trumpeter swan representing marshland communities, and the arctic grayling and the cutthroat trout representing cold water fisheries. Species selected are impacted where timber, range, recreation, roads, and mineral activities are the emphasis in management direction.

The soil and water and riparian MMR's provide for the MMR's for viable fish populations.

The prescriptions applied to identified winter range areas provide adequate forage for big game animals (30 percent wildlife, 35 percent livestock, 35 percent plant vigor). Summer range forage is generally not limiting, so by providing adequate winter range viable populations are maintained. Still, between ten and thirty percent of the forage produced on suitable rangeland is reserved from livestock utilization for wildlife needs.

Analyses assume that hiding cover can be provided through timber sale layout and preparation and that roads will be closed for big game security in timber harvest areas.

Forest-wide standards and guidelines provide for an adequate number of snags for snag dependent species. Guidelines for retaining 10-15 tons of slash per acre provide habitat for small mammals, birds, and insects. Riparian zone management, wilderness, and forested area not assigned to timber management prescriptions provide old growth habitat.

7. Consistency with Multiple Use-Laws

The Secretary of Agriculture under various laws is directed to administer National Forests for multiple uses such as outdoor recreation, range, timber, watershed, wildlife, fish, and minerals. The Secretary is also directed to develop and administer the renewable surface resources.

The prescriptions provide for multiple resource outputs where applied to appropriate areas. In all cases the prescriptions include standards and guidelines for protection of all resources regardless of which resource is scheduled for outputs. For those areas where resource outputs are scheduled, sustained yield and multiple-use principles are followed.

8. Protecting Threatened and Endangered Species Habitat

Two bird species and two animal species found on the Forest have been listed as threatened or endangered. The law specifies habitat of these species will be protected, and this will be done under all alternatives and benchmarks. No plant species have been formally classified.

The endangered bald eagle nests in the southeast portion of the Gravelly Range and winters along the Red Rock, Ruby, Jefferson, Madison, Big Hole, and Beaverhead Rivers. Most migration and wintering activity occurs off Forest. Under all alternatives, standards and guidelines will be adhered to that ensure protection of this species habitat.

The peregrine falcon historically inhabited the Forest but currently there is no known occupied habitat. "Essential" unoccupied habitat has been delineated in the southeast portion of the Gravelly Range. As with the bald eagle, standards and guidelines will be incorporated into all alternatives that protect habitat.

The gray wolf is an occassional visitor to the Continental Divide country in the southern part of the Forest. No evidence of pack activity exists. Prior to ground disturbing activities, all alternatives will require that a logical evaluation be done, and if a "may affect" situation exists, consultation with the U.S. Fish and Wildlife Service will be undertaken.

The grizzly bear is suspected of utilizing a portion of the Madison Range. However, the Beaverhead NF is not included in the "occupied habitat" identified in the Greater Yellowstone Grizzly Bear Recovery Plan. The area believed to be used by the grizzly bear is within the Metcalf Wilderness; therefore, no alternative will adversely affect habitat.

9. Providing for Utility and Transportation Rights-of-Way and Corridors

Land disturbing activities such as timber harvest, land clearing, road construction, pipeline trenches and holes for power poles occur when providing rights-of-way. An analysis outside FORPLAN and prescriptions defined the kinds of land which should be excluded or avoided in permitting or constructing linear corridor facilities. Avoidance areas are areas where establishment and use of corridors conflict with land use or management objectives such as cultural or historic sites, wilderness areas, research natural areas and scenic areas. Potential corridors and existing rights-of-ways were mapped and considered in the alternatives and benchmarks.

10. Road Construction Standards

Access roads are necessary for efficient timber harvest, but road construction affects the soil, water, visual, and riparian resources. Safe road conditions for public use are necessary. The variables considered to establish road standards are road density per square mile and road design requirements. The soil and water MMR discussion includes the assumptions used for road density and road design requirements.

11. Revegetating Temporary Roads

Short temporary roads are sometimes needed to efficiently transport logs; however, they can affect soil and water resources. The road density for the Forest's transportation system and log skid distances were designed to preclude the use of temporary roads in most cases. The minimum requirement is to reestablish forage or grass cover by seeding. Revegetation is included in the logging practices for prescriptions that harvest timber.

12. Maintaining Air Quality

This requirement was handled outside of FORPLAN. The Regional Guide directs the Forest to work through cooperative agreements with the states to manage smoke emissions. Scheduling the time and number of prescribed burns is done outside the FORPLAN model and in cooperation with the State of Montana.

13. **Reforestation**

Reforestation within five years is generally not a problem on the Beaverhead. Lodgepole pine stands usually regenerate naturally as well as high productivity mixed conifer sites. Low productivity mixed conifer sites (predominantly dry site Douglas-fir) do have regeneration problems due to drought stress, western spruce budworm damage to cones, and infrequent cone crops. Generally, shelterwood harvest is scheduled to partially alleviate this problem. In addition, while high-intenstiy prescriptions schedule planting on 100 percent of the acres harvested, moderate intensities schedule 10 percent planting, and low-intensity prescriptions schedule no planting relying on natural regeneration.

14. **Forty-acre Clearcut Limit**

Clearcutting is one silvicultural system used on the Beaverhead for even-aged timber harvest. The Northern Regional Guide establishes that the openings created by even-aged silviculture normally will be 40 acres or less. Costs and practices used are based on clearcuts of 40 acres or less and are included in the management prescriptions.

No constraints were used to force a 40-acre clearcut limit because of the nature of the Beaverhead analysis areas. That is, an analysis area is not necessarily contiguous, so harvesting of a complete analysis area in one decade in the model would not necessarily mean a large contiguous area harvested on the ground. Through spatial fitting and looking at scheduling, it was determined that enough flexibility was built in through the nondeclining flow and analysis area dispersal to meet the 40-acre limit with good sale preparation practices.

C. **Benchmarks**

Eight benchmarks and sixteen iterations of benchmarks were developed to define the resource production potentials and economic interrelationships associated with management of the Forest. The efficient schedule of management activities, resource outputs, environmental effects, economic consequences, and prescription assignments to meet the purpose of each benchmark were estimated. This section describes the purpose of each benchmark. The major objectives and constraints are displayed in Table **B-11**.

Four types of benchmarks were developed for the Forest:

- Benchmarks that maximize present net value for the Forest and display the efficient levels of resource outputs.
- Resource benchmarks define the maximum potential for timber production, range, elk, and wilderness.

- The minimum level benchmark defines the minimum outputs associated with custodial management of the Forest and the unavoidable costs and benefits of public ownership.

- A Current Direction benchmark defines the proposed land uses and production levels associated with continuation of current management direction, specified in the 1978 Beaverhead National Forest Land Management Plan.

The following procedures apply to all benchmarks:

- Developed using FORPLAN.

- Developed using an objective function of maximizing PNV, with the exceptions of the maximize timber benchmark which had a maximize timber objective function, the maximize range benchmark with had an objective function that maximized forage production, and the maximize wildlife benchmark which had an objective function that maximized forage production.

- Not constrained by budget levels.

- Comply with minimum management requirements. (Incremental development and analysis of the minimum management requirements indicated that they could be meet with nondeclining flow constraints or by constraining the harvest occurring in planning units with an acreage constraint. All the benchmarks utilize one or the other of these constraints. An exception is increment 2 of the maximize PNV benchmark. This increment of a benchmark may not meet minimum management requirements because no constraints were imposed to spacially distribute the timber harvest or to distribute over time.)

- Are legally implementable.

- Timber management constraints were used to preclude harvest from existing wildernesses.

- Regulated timber management was constrained to preclude it from all unsuitable timberland.

- A constraint was used so timber inventory in 150 years will equal or exceed the volume that would occur on a regulated Forest.

- Several increments of the present net value and resource benchmarks determined the opportunity cost and resource tradeoffs of meeting specific constraints, objectives, regulations, and policies.

Table B-11

Benchmark Objectives and Constraints

			Timber Harvest Constraints				
Benchmark	Objectives	Objective Function	Harvest Flow	EIC	Tentatively Suitable Timberlands (m acres)	Decade 1 Harvest Floor	Minimum Management Requirements
Minimum Level	Identify fixed cost of public land ownership and incidental outputs.	Maximize PNV. Required use of custodial prescriptions.	None	no	0	none	yes
Maximum Wilderness	Define benefits and tradeoffs of the maximum wilderness potential.	Maximize PNV,with market and non-market values.	NDY	yes	347	none	yes
Maximum Timber	Define benefits and tradeoffs and timber volumes associated with maximum timber production.	Maximize Timber	NDY	yes	808	none	yes
Maximum Wildlife	Identify maximum elk forage production levels.	Maximize Forage Production	NDY	yes	715	none	yes
Maximum Livestock Range	Identify maximum livestock forage production levels.	Maximize Forage Production	none	yes	664.4	none	yes
Maximum PNV	Define the PNV of market and non-market values. MMR's are met.	Maximize PNV with market and non market values.	NDY	yes	731	none	yes
Maximum PNV INCREMENT 1.	Define the PNV of market and non-market values. MMR's are met.	Maximize PNV with market and non market values.	25% link between decades	yes	731	none	yes
Maximum PNV (market)	Define the PNV of market values only. MMR's are met.	Maximize PNV with market values.	NDY	yes	731	none	yes
Current Direction	Indentify the outputs and economic tradeoffs of continuing current direction and land allocations with a budget constraint.	Maximize PNV with market and non market values. Allocations were constrained but min level was allowed as an option to meet budget levels.	NDY	yes	507	none	yes

Requirements for a benchmark that maximized PNV with market and non market values but that did not ensure protection of MMR's are met by the Maximum PNV benchmark because MMR's are built into the prescriptions and also met through the non-declining flow and ending inventory constraints required for the Maximum PNV benchmark.

1. **Minimum Level Benchmark** (Run I.D.--102MLA)

This benchmark defines the minimum costs of public landownership and the resource outputs which are incidental to Forest Service management. The objective function is to maximize PNV with only three management prescriptions available for selection, custodial management, wilderness study, and wilderness management. In the latter, wilderness management occurs at reduced service levels. Existing timber sales and grazing permits are phased out so that costs and outputs for these activities are zero at the end of decade one. The minimum level benchmark is required by CFR 36 219.12(e) and the Chief's letter dated May 31, 1983. This benchmark provides the basis for evaluating the economic costs and benefits of National Forest management as displayed in the maximum PNV benchmark and in the alternatives.

2. **Maximum Wilderness Benchmark** (Run I.D.--102-MWA)

This benchmark explores the opportunity to maximize classified wilderness on the Beaverhead Forest. The objective function is to maximize PNV. All roadless areas identified in the roadless area reevaluation including those identified in the RARE II analysis are assigned a wilderness prescription. Areas outside the roadless areas are assigned a variety of prescriptions, with that assignment guided by the maximize PNV objective function. An ending inventory constraint and nondeclining flow apply. This benchmark defines the maximum wilderness designation and management costs and benefits. The opportunity costs of maximizing wilderness designation and management are established by comparing this benchmark with the maximum PNV benchmark.

3. **Maximum Timber Benchmark** (Run I.D.--102-MTD)

This benchmark explores the costs and benefits of maximizing timber production on the Beaverhead Forest. In this benchmark, the only constraints are for nondeclining flow of timber and an ending inventory. The objective function is to maximize timber. The nondeclining flow and ending inventory constraints ensure a distribution of harvest over time and space so the soil and water resources are protected. Timber harvest is not permitted in the wildernesses. The economic tradeoffs of maximizing timber can be assessed by comparing this benchmark with the maximum PNV benchmark. The tentatively suitable acreage is 809,000.

Several iterations of the Maximum timber benchmark were developed.

Maximum Timber Benchmark, increment 1 (Run I.D. 102-MTA) - This increment is similiar to the maximum timber benchmark; however, timber harvest is permitted on wilderness as well as nonwilderness suitable lands. Capable acres in the Anaconda-Pintler Wilderness comprise a very small portion of the entire capable land base (roughly 35,000 acres of 900,000 acres). In this benchmark, about 10,000 acres were scheduled for timber harvest. This increment also has slightly different costs associated with it than the benchmarks have.

Maximum Timber Benchmark, increment 2(Run I.D. 102-MTB) - This increment determines the maximum timber production level when no constraints on existing laws, policies, and regulations are incorporated in the analysis. Also, timber harvest is permitted in wilderness as well as on nonwilderness suitable lands. This benchmark, if compared to the maximum timber benchmark, shows the timber harvest volume tradeoff associated with protection of the soil and water resources. Costs associated with this increment are not comparable with the maximum timber benchmark but are comparable with increment 1.

Maximum Timber Benchmark, increment 3 (Run I.D. 102MPA) - This increment determines the maximum possible timber production when the nondeclining flow and ending inventory constraints are used as well as when clasified and recommended wilderness areas are not available for timber harvest. Timber havest is permitted in the West Pioneer Wilderness Study Area and in the RARE II further planning areas. In addition, timber yield tables are used which model reduced green timber volume as a result of anticipated mountain pine beetle infestations. The purpose of this increment is to show the expected timber volume losses resulting from the mountain pine beetle infestation.

Maximum Timber Benchmark, increment 4 (Run I.D. 102-MTC) - This increment determines the maximum possible timber production when the nondeclining flow and ending inventory constraints are used as well as when classified and recommended wilderness areas are not available for timber harvest. Timber harvest is permitted in the West Pioneer Wilderness Study Area and in the RARE II further planning areas.

Maximum Timber Benchmark, increment 5 (Run I.D. 102-TMA) - This increment determines the maximum possible timber production when timber harvest is permitted on all capable and available lands, excluding only classified wilderness. No ending inventory or nondeclining flow constraints were used; therefore, harvest constraints had to be employed that limited the amount of harvest occurring per decade in each planning unit. This increment used as decade harvest floors the timber outputs from another FORPLAN run which had an objective function of maximizing timber. This increment has a maximize PNV objective function.

4. **Maximum Wildlife Benchmark** (Run I.D. 102WRA)

This benchmark focuses on the Forest's elk habitat production potential. The benchmark maximizes forage production with a maximize forage objective function. Timber harvest is permitted on all potentially suitable lands outside classified and recommended wildernesses. The ending inventory and nondeclining flow constraints are incorporated in the model. No livestock grazing would be permitted on elk winter ranges to provide the maximum amount of elk forage. This benchmark assumes elk on winter ranges utilize 65 percent of plant production, with 35 percent retained to ensure continuing plant vigor. To ensure forage production, constraints were used to require a timber harvest of at least 175 MMBF per decade.

An increment of the maximum wildlife benchmark was hand calculated, varying the amount of winter range forage that would be available to elk. In this increment, 30 percent of plant production would be utilized by elk, 35 percent would be available to livestock, and 35 percent would be retained to ensure continuing plant vigor. This increment can be compared to the maximum wildlife benchmark to explore the tradeoffs between elk and livestock use of winter range forage.

5. **Maximum Livestock Range Benchmark** (Run I.D. 102-RGB)

This benchmark displays the maximize livestock production potential of the Forest as it relates to forage production potential. Forage production is maximized by utilizing an objective function. Forage production is maximized by improving range conditions to excellent through investments, and by creating transitory range through timber harvest. Therefore, timber harvest is allowed on all potentially suitable lands. An ending inventory constraint for timber is utilized. In addition, sequential bounds link timber harvest between decades, allowing no more than a fluctuation of 25 percent between decades. This ensured that the creation of transitory range was reasonable. As the amount of transitory range varies, the amount of livestock capacity varies through the planning horizon. Harvest constraints are incorporated to ensure protection of the soil and water resources.

An increment of the maximum range benchmark (102-RGA) was run that was similiar to the benchmark but that used as constraints from another run the decade outputs for AUM's and had a maximum PNV objective function. This increment had different range utilization standards than the benchmark and subsequently the alternatives.

Another increment of the maximum livestock range benchmark (Run I.D. 102-MRA) was developed that displays the tradeoffs in transitory range potential when all recommended wildernesses are removed from the potentially suitable timber land base. Also, ending inventory and nondeclining flow constraints were incorporated in the model. The timber constraints resulted in lower forage production potentials. The utilization standards of this benchmark increment are similiar to increment 1 not the range benchmark.

6. **Maximum Present Net Value (PNV) Benchmark** (Run I.D. 102-NWA)

This benchmark explores the opportunity to maximize the monetary value (cost efficiency) of priced market (timber, range, developed recreation, and mineral leases) and nonmarket resources (dispersed recreation, wildlife, visual quality, wilderness, soil and water). It defines the "mix of resource uses, combined with a schedule of outputs that have an established market price or are assigned a monetary value" as required by CFR 219-12 (e) and Chief's letter dated May 31, 1983. This benchmark provides the basis for evaluating the economic tradeoffs of the minimum management requirements (MMR's) and nondeclining flow. It also provides a basis of comparison for the other benchmarks which strive to maximize resources such as wilderness, elk habitat production potential, livestock forage, and timber. It provides a basis for evaluating the costs and benefits of continuing current management direction. And finally, the maximum PNV benchmark, because it has the highest PNV, provides the basis for determining the opportunity cost of implementing the alternatives, each of which is constrained to meet specific resource management objectives.

The maximum PNV benchmark includes the ending inventory and nondeclining flow constraints on timber harvest. The West Pioneer Wilderness Study Area has been assigned a custodial management prescription. All potentially suitable lands are available for timber harvest.

Several iterations of the maximum PNV benchmark were developed.

Maximum PNV Benchmark, increment 1 (Run I.D. 102-NWB) - This increment is exactly the same as the maximum PNV benchmark described above, except the West Pioneer Wilderness Study Area is assigned the most cost-efficient mix of nonwilderness prescriptions. This increment, if compared to the maximum PNV benchmark, shows the economic and resource outputs associated with the West Pioneers.

Maximum PNV Benchmark, increment 2 (Run I.D. 102-MSA) - This increment is modeled the same as the maximum PNV benchmark however, instead of nondeclining flow constraining timber harvest, sequential upper and lower bounds are incorporated for each decade that allow timber harvest levels to vary only 25 percent between decades. In addition, timber havest is excluded from the classified wilderness area. The economic tradeoffs of nondeclining flow are established by comparison with the maximum PNV benchmark.

Maximum PNV Benchmark, increment 3 (Run I.D. 102-BMA) - This increment is modeled without nondeclining flow but with the ending inventory constraint. The classified wilderness area is not available for timber harvest. Harvest constraints were employed that limited the amount of harvest occurring per decade in each planning unit to ensure protection of soil and water resources. This increment provides another opportunity to evaluate the economic tradeoffs of nondeclining flow through comparison with the maximum PNV benchmark.

Maximum PNV Benchmark, increment 4 (Run I.D. LMPBE2) - This increment is modeled without nondeclining flow and without the ending inventory constraint. The classified wilderness area is not available for timber harvest. Harvest constraints were employed that limited the amount of harvest occurring per decade in each planning unit to ensure protection of soil and water resources. Only timber values were incorporated in the calculations of PNV. This increment can be compared with increment 2 to evaluate the tradeoffs associated with the ending inventory constraint.

Maximum PNV Benchmark, increment 5 (Run I.D. LMPBEI) - This increment is modeled without nondeclining flow or ending inventory constraints. The classified wilderness area is not available for timber harvest. No constraints were used to ensure minimal protection of soil and water. Only timber values were incorporated in the calculations of PNV. This increment can be compared with increment 3 to evaluate the costs associated with the miminal management requirements associated with protection of the soil and water resources.

Maximum PNV Benchmark, increment 6 (Run I.D. 102PNA) - This increment is modeled the same as the maximum PNV benchmark, with an ending inventory constraint and nondeclining flow. Assigned and market values contribute to calculations of PNV. The only difference between the maximum PNV benchmark and this increment is that in the latter, classified wilderness and roadless areas recommended for wilderness in RARE II are not available for timber harvest. By comparing this increment with the benchmark, the tradeoffs associated with the wilderness classification or recommendation are apparent.

Maximum PNV Benchmark, increment 7 (Run I.D. 102-PNB) - This increment is modeled the same as the maximum PNV benchmark, with an ending inventory constraint and nondeclining flow. Assigned and market values contribute to calculations of PNV. However, in this increment timber harvest is scheduled in the Anacona- Pintler Wilderness.

Maximum PNV Benchmark, increment 8 (Run I.D. 102-C3A) - This increment is modeled the same as the maximum PNV benchmark increment 3; however, sequential upper and lower bounds are incorporated for each decade that allow timber harvest levels to vary only 25 percent between decades. In addition, timber havest is excluded from the Anaconda-Pintler Wilderness but not from the Metcalf Wilderness.

7.**Maximum PNV Benchmark (Market values only)** (Run I.D. 102NWZ)

This benchmark explores the opportunity to maximize the net market values of the Beaverhead NF. It defines the "mix of resource uses, combined with a schedule of outputs and costs, which will maximize the present net value of those major outputs that have an established market price" (CFR 219.12e). It was modeled like the maximum PNV benchmark (that included both market and assigned values). Only timber, developed recreation and range values contribute to the calculations of PNV.

8. **Current Level Benchmark** (Run I.D. 102-CDB)

This benchmark defines "the current level of goods and services provided by the unit and the most likely amount of goods and services expected to be provided in the future if current management direction continues" (36 CFR 219.12e). This benchmark was modeled by assigning prescriptions to analysis areas that most closely modeled current management direction as it was specified in the existing 1978 Beaverhead NF Land Management Plan and through the RARE II final environmental impact statement. The opportunity cost of continuing current management with no budget constraints to reflect existing and historic budgets can be determined by comparing this benchmark with the maximum PNV benchmark. This benchmark also provides the opportunity to examine the tradeoffs associated with the budget constraints of Alternative A, the "no-action" or Current Program alternative.

D. **Comparisons of Benchmarks**

The monetary and resource management tradeoffs associated with the management options and opportunities explored in the Analysis of the Management Situation can be discussed by comparing the benchmarks described in Section C. A discussion of the monetary tradeoffs must be limited to the priced benefits. Resource tradeoffs analyzed must be those that were adequately modeled within the FORPLAN analysis.

This section focuses on the tradeoffs associated with implementation of minimum management requirements, nondeclining flow, and the resource objectives of the various benchmarks. Nonmarket resource values and outputs are discussed in terms of their influence on proposed land use. This section also discusses the costs of implementing current direction and the costs of a minimum level of management.

Table **B-12** shows selected resource outputs and economic data for the benchmarks.

Table B-12 Resource Allocation and Average Annual Outputs

Resource	Unit of Measure	1980	Benchmarks								
			Min Level	Max Wilder	Max Timber	Max Range	Max Wildlife	Max PNV	Max PNV (Market only)	Max PNV Increment 1	Current Direction
Developed Recreation Use	M RVD/yr*										
Decade 1			0	190.1				190.1			190.1
Decade 3			0	284.8				284.8			284.8
Decade 5			0	379.0				379.0			379.0
Decade 10			0	379.0				379.0			379.0
Decade 15			0	379.0				379.0			379.0
Dispersed Recreation Use Type I	M RVD/yr*										
Decade 1			41.7	41.7				41.7			41.7
Decade 3			41.7	53.7				53.7			53.7
Decade 5			41.7	65.8				65.8			65.8
Decade 10			41.7	65.8				65.8			65.8
Decade 15			41.7	65.8				65.8			65.8
Dispersed Recreation Use Type II	M RVD/yr*										
Decade 1			127.7	127.7				127.7			127.7
Decade 3			143.3	164.8				164.8			164.8
Decade 5			143.3	201.8				201.8			201.8
Decade 10			143.3	201.8				201.8			201.8
Decade 15			143.3	201.8				201.8			201.8
Dispersed Recreation Use Type III	M RVD/yr*										
Decade 1			174.8	174.8				174.8			174.8
Decade 3			0	239.4				239.4			239.4
Decade 5			0	303.9				303.9			303.9
Decade 10			0	303.9				303.9			303.9
Decade 15			0	303.9				303.9			303.9
Wilderness Recreation Use	M RVD/yr*										
Decade 1		20.9	21.7	21.7				21.7			21.7
Decade 3			25.9	25.9				25.9			25.9
Decade 5			35.7	35.7				35.7			35.7
Decade 10			35.7	35.7				35.7			35.7
Decade 15			35.7	35.7				35.7			35.7
Elk Hunting Potential	M RVD/yr										
Decade 1			66.4	66.4	63.1	62.4	63.8	63.8		62.4	65.8
Decade 3			66.4	63.1	57.1	55.1	60.4	60.4		57.8	63.1
Decade 5			66.4	63.8	56.5	56.5	59.8	59.8		59.8	62.4
Wilderness Management	M Acres	72.526	163.5	1405.6	163.5	163.5	72.5**	163.5	163.5	163.5	506.9***
Roadless Management	M Acres		1544	174	916	1021	943	989	989	989	1258

* Only projected recreation use is displayed.
** This includes the Anaconda-Pintler Wilderness only.
*** Includes wilderness study areas and further planning areas.

Table B-12 (cont.)

Resource	Unit of Measure	1980	Benchmarks								
			Min Level	Max Wilder	Max Timber	Max Range	Max Wildlife	Max PNV	Max PNV (Market only)	Max PNV Increment 1	Current Direction
Old Growth on Suitable Timberlands in 100 Years	%			10				10			18
Visual Quality on Suitable Timberlands	M Acres										
Preservation			329.0	1405.6				164.5			506.9
Ret./Partial Retention			1811.2	503.3				1504.9			1173.6
Modification/ Maximum Modification			0	231.2				471.7			459.7
Potential Range Forage	M AUM/yr	190									
Decade 1			144	178	163	231	227	180	180	191	190
Decade 3			0	182	171	246	309	196	196	208	190
Decade 5			0	189	174	208	236	201	201	187	190
Decade 10			0	180	164	217	230	182	182	191	190
Decade 15			0	190	172	212	262	196	196	204	190
Base Timber Sale Schedule	MMBF/yr	28									
Decade 1			0	28.2	53.5	77.8	49.0	55.4	55.4	124.8	37.6
Decade 3			0	28.2	53.5	89.0	49.0	55.4	55.4	70.2	34.3
Decade 5			0	28.2	53.5	15.7	49.0	55.4	55.4	39.6	24.6
Decade 10			0	22.4	70.4	51.2	49.0	46.7	46.7	22.9	31.1
Decade 15			0	26.6	74.9	61.0	49.0	53.6	53.6	83.1	28.3
Base Timber Sale Schedule	MMCF/yr										
Decade 1			0	8.3	19.8	27.8	17.5	17.3	17.3	41.6	10.0
Decade 3			0	8.3	19.8	31.8	17.5	17.3	17.3	23.4	10.0
Decade 5			0	8.3	19.8	5.6	17.5	17.3	17.3	13.2	10.0
Decade 10			0	8.3	22.7	18.3	17.5	17.3	17.3	8.8	10.0
Decade 15			0	8.3	22.7	21.8	17.5	17.3	17.3	26.8	9.9
Long Term Sustained Timber Yield	MMBF		0	25.7	68.1	49.8	55.2	51.9	51.9	41.7	29.0
Long Term Sustained Timber Yield	MMCF		0	8.3	22.7	17.8	19.7	17.3	17.3	13.9	10.2
Suitable Timber Land	M Acres		0	347.1	808.4	664.4	715.1	730.6	730.6	730.6	506.7
Reforestation	Acres/yr										
Decade 1			0	257	6102			517			475
Decade 3			0	142	7385			374			237
Decade 5			0	32	2841			44			484
Timber Stand Improvement	Acres/yr	50									
Decade 1			0	517	656			523			78
Decade 3			0	2568	9895			5172			276
Decade 5			0	1421	8612			3743			0
Research Natural Areas	Acres		1429	1429	1429	1429	1429	1429	1429	1429	1429

Table B-12 (cont.)

			Benchmarks								
Resource	Unit of Measure	1980	Min Level	Max Wilder	Max Timber	Max Range	Max Wildlife	Max PNV	Max PNV (Market only)	Max PNV Increment 1	Current Direction
Roads needed for Mgmt.	Miles		0	2225	5531	4407	4789	4970	4970	4968	3487
Road Construction (total)	Miles/yr										
Decade 1			0	33.2	79.5	64.6	69.7	72.1	72.1	72.1	51.6
Decade 3			0	26.9	67.6	53.7	58.4	60.7	60.7	60.6	42.4
Decade 5			0	22.8	57.3	45.5	49.5	51.4	51.4	51.4	35.9
Decade 10			0	14.3	36.1	28.6	31.1	32.3	32.3	32.3	22.5
Decade 15			0	0	0	0	0	0	0	0	0
Local Forest-related Employment	Jobs										
Decade 1			620	1041	1441	1704	1388	1411			1190
Decade 3			234	1219	1645	2166	1647	1600			1308
Local Forest-related Income	MM$										
Decade 1			9.5	18.4	26.7	32.6	25.6	26.3			21.5
Decade 3			3.4	20.8	29.6	40.6	29.6	28.9			22.7
Total Costs*	M$/yr.										
Decade 1			2938	4705	8003	8693	6895	6135	6135	7688	5711
Decade 3			2790	4835	9033	9978	7677	6290	6290	7365	5274
Decade 5			2883	4816	8032	6353	7807	6247	6247	6242	5564
Decade 10			2883	4410	6986	6322	5893	5444	5444	5262	5443
Decade 15			2883	4367	7837	6507	6278	5126	5126	5502	4725
Recreation Costs	M$/yr.										
Developed											
Decade 1			188	188	188	188	188	188	188	188	188
Decade 3			282	282	282	282	282	282	282	282	282
Decade 5			375	375	375	375	375	375	375	375	375
Decade 10			375	375	375	375	375	375	375	375	375
Decade 15			375	375	375	375	375	375	375	375	375
Range Costs	M$/yr.										
Decade 1			242	299	274	389	382	302	302	321	401
Decade 3			0	307	287	413	519	329	329	349	406
Decade 5			0	317	292	350	396	338	338	314	454
Decade 10			0	303	276	364	387	306	306	320	391
Decade 15			0	319	290	357	441	329	329	342	421
Timber Costs	M$/yr.										
Decade 1			0	545	2552	3305	1349	1116	1116	2575	829
Decade 3			0	768	3826	4777	2213	1504	1504	2528	558
Decade 5			0	696	2908	1412	2508	1482	1482	1497	813
Decade 10			0	461	2276	1591	934	1084	1084	914	971
Decade 15			0	638	3614	2293	1767	1253	1253	1659	625
Other Costs	M$/yr.										
Decade 1			2508	2933	3385	3457	3537	3047	3047	3122	3199
Decade 3			2508	2908	3354	3455	3531	3005	3005	3037	3190
Decade 5			2508	2929	3354	3312	3554	3046	3046	3050	3197
Decade 10			2508	2914	3321	3380	3542	3003	3003	2977	3208
Decade 15			2508	2908	3419	3343	3556	3030	3030	2987	3169

* Max wildlife was developed prior to recent cost adjustments. Therefore cost information is overestimated.

Table B-12 (cont.)

Resource	Unit of Measure	1980	Min Level	Benchmarks Max Wilder	Max Timber	Max Range	Max Wildlife	Max PNV	Max PNV (Market only)	Max PNV Increment 1	Current Direction
Road Costs*	M$/yr.										
Decade 1			0	740	1604	1354	1441	1482	1482	1482	1094
Decade 3			0	570	1284	1051	1132	1170	1170	1169	838
Decade 5			0	499	1103	904	974	1006	1006	1006	725
Decade 10			0	357	738	612	655	676	676	676	498
Decade 15			0	127	139	139	139	139	139	139	135
Purchaser Credit Road Costs	M$/yr.										
Decade 1			0	455	1182	932	1019	1060	1060	1060	719
Decade 3			0	425	1102	869	950	988	988	987	669
Decade 5			0	362	941	742	812	844	844	844	572
Decade 10			0	230	599	473	516	537	537	537	363
Decade 15			0	0	0	0	0	0	0	0	0
Capital Investment Road Costs	M$/yr.										
Decade 1			0	285	422	422	422	422	422	422	375
Decade 3			0	145	182	182	182	182	182	182	169
Decade 5			0	137	162	162	162	162	162	162	153
Decade 10			0	127	139	139	139	139	139	139	135
Decade 15			0	127	139	139	139	139	139	139	135
Total Capital Investment Costs	M$/yr.										
Decade 1			0	285	422	422	422	422	422	422	375
Decade 3			0	145	182	182	182	182	182	182	169
Decade 5			0	137	162	162	162	162	162	162	153
Decade 10			0	127	139	139	139	139	139	139	135
Decade 15			0	127	139	139	139	139	139	139	135
Operation/Maintenance Costs	M$/yr.										
Decade 1			2938	3965	6399	7339	5456	4653	4653	6206	4617
Decade 3			2790	4265	7749	8927	6545	5120	5120	6196	4436
Decade 5			2883	4317	6929	5449	6833	5241	5241	5236	4839
Decade 10			2883	4053	6248	5710	5238	4768	4768	4586	4945
Decade 15			2883	4240	7698	6368	6139	4987	4987	5363	4590
Return to U.S. Treasury	M$/yr										
Decade 1			225	4521	6085			9344			6121
Decade 3			19	7253	10122			14142			8055
Decade 5			19	12082	16639			24420			8657
Decade 10			19	9344	23899			19350			11147
Decade 15			19	8615	27086			17224			10267

* Road costs are the total of purchaser credit and capital investment road costs.

Table B-12 (cont.)

Resource	Unit of Measure	1980	Benchmarks								
			Min Level	Max Wilder	Max Timber	Max Range	Max Wildlife	Max PNV	Max PNV (Market only)	Max PNV Increment 1	Current Direction
Return to States	M$/yr										
Decade 1			56	1130	1521			2336			1530
Decade 3			5	1813	2530			3536			2014
Decade 5			5	3021	4160			6105			2164
Decade 10			5	2336	5975			4838			2787
Decade 15			5	2154	6771			4306			2567
Special Use Returns	M$/yr										
Decade 1			19	19	19			19			19
Decade 3			19	19	19			19			19
Decade 5			19	19	19			19			19
Decade 10			19	19	19			19			19
Decade 15			19	19	19			19			19
Return to U.S. Treasury	M$/yr										
Decade 1			225	4521	6085			9344			6121
Decade 3			19	7253	10122			14142			8055
Decade 5			19	12082	16639			24420			8657
Decade 10			19	9344	23899			19350			11147
Decade 15			19	8615	27086			17224			10267
Return to States	M$/yr										
Decade 1			56	1130	1521			2336			1530
Decade 3			5	1813	2530			3536			2014
Decade 5			5	3021	4160			6105			2164
Decade 10			5	2336	5975			4838			2787
Decade 15			5	2154	6771			4306			2567
Special Use Returns	M$/yr										
Decade 1			19	19	19			19			19
Decade 3			19	19	19			19			19
Decade 5			19	19	19			19			19
Decade 10			19	19	19			19			19
Decade 15			19	19	19			19			19
Range Returns	M$/yr										
Decade 1			206	255	233			257			272
Decade 3			0	260	245			280			272
Decade 5			0	270	249			287			272
Decade 10			0	257	235			260			272
Decade 15			0	272	246			280			272
Timber Returns	M$/yr										
Decade 1			0	4247	5833			9068			5830
Decade 3			0	6974	9858			13843			7764
Decade 5			0	11793	16371			24114			8366
Decade 10			0	9068	23645			19071			10856
Decade 15			0	8324	26821			16925			9976

Table B-12 (cont.)

			Benchmarks								
Resource	Unit of Measure	1980	Min Level	Max Wilder	Max Timber	Max Range	Max Wildlife	Max PNV	Max PNV (Market only)	Max PNV Increment 1	Current Direction
Market Resource Benefits	M$/yr										
Decade 1			2153	6356	7811	12642	8524	11191	11191	24077	9008
Decade 3			1036	9567	12349	21883	12861	16550	16550	14928	11422
Decade 5			1724	15125	19578	8842	16734	27553	27553	13325	13027
Decade 10			1724	12328	26772	21759	22121	22349	22349	9984	15108
Decade 15			1724	11666	30015	30543	19994	20320	20320	34005	14421
Nonmarket Resource Benefits	M$/yr										
Decade 1			2111	2111	2111	2111	2111	2111	174	2111	2111
Decade 3			1316	3303	3303	3303	3303	3303	236	3303	3303
Decade 5			1755	5224	5224	5224	5224	5224	400	5224	5224
Decade 10			1755	5224	5224	5224	5224	5224	400	5224	5224
Decade 15			1755	5224	5224	5224	5224	5224	400	5224	5224
Costs discounted at 4%	MM$										
Developed Recreation			7	7	7	7	7	7	7	7	7
Range			2	8	7	10	11	8	8	8	10
Timber			0	17	72	73	43	36	36	53	19
Roads			0	15	33	28	30	31	31	31	22
Other			63	74	85	86	89	76	76	78	81
Benefits Discounted at 4%	MM$										
Recreation/Wildlife			68	106	106	106	106	106	31	106	106
Range			13	39	36	51	70	41	41	42	67
Timber			0	154	275	298	238	309	309	383	166
Other			0	0	0	0	0	0	0	0	0
Present Value Benefits (4%)	MM$		81	300	418	455	414	456	381	531	340
Present Value Costs (4%)	MM$		72	120	205	204	180	158	158	176	140
Present Net Value* (4%)	MM$		9	180	213	251	234	298	223	355	200
Opportunity Cost (4%)	MM$		289	118	85	47	64	0	75	-57	98
Benefit/Cost Ratio (4%)			1.13	2.50	2.04	2.23	2.30	2.89	2.41	3.02	2.43
Present Value Benefits (7 1/8%)	MM$		48	148	185	246	191	225	190	323	172
Present Value Costs (7 1/8%)	MM$		41	67	115	121	100	88	88	104	79
Present Net Value (7 1/8%)	MM$		7	80	70	125	91	137	101	218	93

* Max wildlife was developed prior to recent cost adjustments. Therefore cost information is overestimated.

Table **B-13** displays the selected prescriptions for the benchmarks. Table **B-14** shows the economic effects by resource group for each of the benchmarks. Figure **B-1** shows the resource/opportunity cost relationships explored in the benchmark analysis between constraints and objective functions.

Figure B-1

Resource and Opportunity Cost Relationships Within the Benchmarks

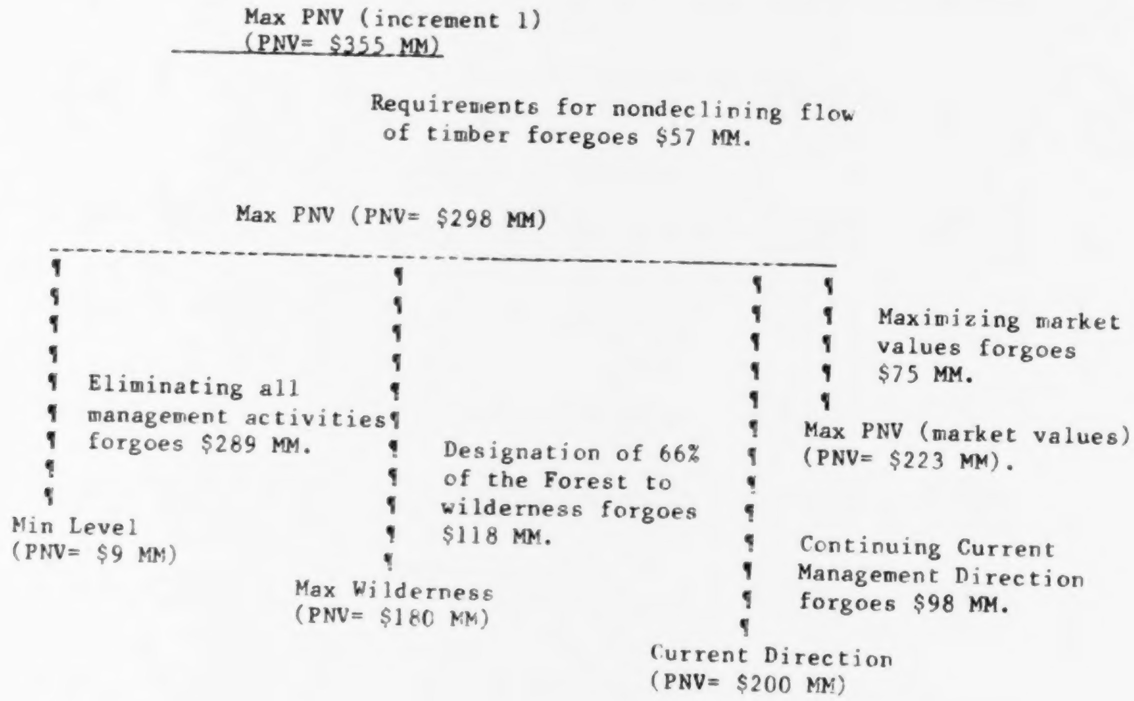
Max PNV (increment 1)
(PNV= $355 MM)
Requirements for nondeclining flow of timber foregoes $57 MM.
Max PNV (PNV= $298 MM)
Eliminating all management activities forgoes $289 MM.
Min Level
(PNV= $9 MM)
Designation of 66% of the Forest to wilderness forgoes $118 MM.
Max Wilderness
(PNV= $180 MM)
Maximizing market values forgoes $75 MM.
Max PNV (market values)
(PNV= $223 MM).
Continuing Current Management Direction forgoes $98 MM.
Current Direction
(PNV= $200 MM)

Table B-13

Land Allocation by Management Perscription for Benchmarks (thousand acres)

Management Perscriptions	Benchmarks								
	Minimum Level	Maximum Timber	Maximum Wildlife	Maximum Livestock	Maximum Wilderness	Maximum Maximum PNV	Maximum PNV (market)	PNV increment I	Current Direction
Custodial									
Minimum Level	1,811.24	114.61	177.38	484.0	188.45	481.04	481.04	455.44	210.58
Wilderness									
Wilderness	163.50	163.50	72.50*	163.50	1,405.60	163.50	163.50	163.50	506.90**
WSA	256.7	117.05	279.47					104.69	434.59
Recreation									
Rec I		166.01	.5	263.07	33.28	416.65	416.65	455.51	70.13
Rec II		137.07	2.76	73.36	15.72	166.92	166.92	142.23	163.0
Rec III		59.35	4.44	77.71					41.97
Rec-Range&tim lo									3.57
Rec-Range&tim mod		1.75	3.61	25.77	.93			1.63	
WP-rec-area		13.65		22.40	56.38	1.19	1.19	1.19	
Rec-tim lo									4.58
Rec-range mod									40.18
Timber									
Tim Hi (M/MM)				.83				.83	76.73
Tim Hi (R/PR)									
Tim Mod (M/MM)		417.15	81.0	231.79	210.64	415.18	415.18	389.42	79.44
Tim Mod (R/PR)		112.58	69.37	69.72	13.66	49.24	49.24	86.48	
Tim Lo (M/MM)		8.0	34.69	4.75	4.77	4.83	4.83	4.83	
Tim Lo (R/PR)		1.82	1.82	1.82		1.05	1.05	1.05	
Tim mod range mod									203.32
Tim hi range mod		104.21	45.15	190.89	15.79	51.64	51.64	4.68	17.81
Tim-rec-range									79.57
Tim-rec-wildlife									22.84
Range									
range hi tim mod									20.12
R-wildlife-rec lo		1.57	1.86	4.20		1.33	1.33	1.57	8.82
R-wildlife-rec II		144.11	245.32	48.19	52.15	29.46	29.46	55.15	383.45
R-tim-rec		24.85	157.5	33.67	.02	19.06	19.06	48.74	
range-lo		39.28	12.28	17.41	22.65	35.55	35.55	33.80	3.87
range-mod		16.44	10.64	77.84	12.66	36.07	36.07	11.95	136.53
R-wildlife&tim lo									.94
Wildlife									
Wildlife-tim hi		35.63	174.88	21.85					
Wildlife-tim mod		125.21	39.29			3.39	3.39		
W-range hi-tim lo		4.86	13.08	31.85	61.56	113.92	113.92	154.52	11.0
W-range mod-T mod		10.04	10.37	16.68		3.97	3.97	6.08	
W-tim lo-range hi									.49
W-hi-Range-m-Tim-m				12.97	1.87			1.42	
W-range mod		28.94	12.99	93.33		61.01	61.01	44.88	.93
W-range hi		7.22	32.05	3.67					
W-summer		5.19	232.23	42.46	1.35	.55	.55	18.15	
W-summer no Tim		188.12		252.10	3.23	10.19	10.19	10.19	
W-hi-Tim-m		43.83		23.30	6.14			.65	
W-hi-range mod		16.75	104.52	17.80	.05	6.2	6.2	6.19	
W-lo-Range-mod		17.17		39.13	38.37			57.79	
W-winter		12.18	168.92	24.09	2.81				
W-riparian									5.89
W-rec-tim lo									1.09
Riparian									
Rip enhancement		79.94	4.3	13.29	30.39	67.75	67.75	67.75	2.46
Rip (retention)		11.69	79.13	74.23	8.57	.43	.43	.43	
Water-ret		2.21	7.62	5.53					6.12
Water-rehab		23.83	67.38	6.33					37.85

* Includes Anaconda-Pintler Wilderness only (run prior to establishment of Lee Metcalf Wilderness)

** Includes Wilderness Study Area and Further Planning Area

Table B-14

Present Value Benefits and Costs (MM$)
Benchmarks

Benchmark	Present Net Value at 4%	Benefits Discounted at 4%				Costs Discounted at 4%				
		Timber	Recreation/ Wildlife	Range	Other	Timber	Roads	Developed Recreation	Range	Other*
Min Level	9	0	68	13	0	0	0	7	2	63
Max Wilderness	180	154	106	39	0	17	15	7	8	74
Max Timber	213	275	106	36	0	72	33	7	7	85
Max Range	251	298	106	51	0	73	28	7	10	86
Max Wildlife	234	238	106	70	0	43	30	7	11	89
Max PNV	298	309	106	41	0	36	31	7	8	76
Max PNV - Market Values	223	309	31	41	0	36	31	7	8	76
Max PNV - Increment 1	355	383	106	42	0	53	31	7	8	78
Current Direction	200	166	106	67	0	19	22	7	10	81

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*Includes recreation and wildlife costs that can not be separated from other costs. In addition other costs contain costs for General Administration and other non-separable costs that could not be assigned to individual resources. This makes the comparisons of individual resources misleading.

The following discusses the major comparison findings from the benchmark analysis.

1. Range of Investment Opportunities

The parameters of the analysis of investment opportunities are defined by the minimum level benchmark and the maximum present net value (PNV) benchmark. The minimum level benchmark models custodial land management for the Forest, with costs reflecting the minimum costs associated with maintenance of public ownership. The maximum PNV benchmark represents a management regime which maximizes PNV when both market and nonmarket resources are assigned values. The minimum discounted cost (using the 4% rate) of federal land stewardship is $72 million and the discounted benefits of resource outputs incidental to a custodial level of management is $81 million, resulting in a cost/benefit ratio of roughly 1.13. The PNV of the minimum management level benchmark is $9 million, compared to a PNV for the maximum PNV benchmark of $298 million. Thus the opportunity cost of minimum management is $289 million, the highest opportunity cost of all benchmarks and alternatives. All other management regimes, with specified resource management objectives and requirements, will lie between the two benchmarks discussed above, with lesser PNV than the maximum PNV benchmark and lesser opportunity cost than the minimum level benchmark.

2. Non-declining timber flow

The tradeoffs of nondeclining timber harvest flow are determined by comparing the maximum PNV benchmark and the maximum PNV benchmark, increment II. In the latter, the timber harvest volume could fluctuate up and down 25 percent between decades, while in the maximum PNV benchmark timber harvest could not decline between decades. Nondeclining flow reduces PNV by about $57 million or 16.5 percent.

Nondeclining flow more significantly affects the timber volume that can be scheduled for harvest within the planning horizon. Departing from nondeclining flow allows significantly more volume to be harvested in the first six decades. First decade harvest volume is 41.6 MMCF per year (124.8 MMBF), decreasing to 13.2 MMCF per year (39.6 MMBF) in decade five. The lowest harvest volume occurs in decade eight with 5.6 MMCF per year. Volumes increase from decade eight through the end of the planning horizon. The long-term sustained yield is 13.9 MMCF per year (41.7 MMBF per year). First decade harvest volume for the maximum PNV benchmark is 17.3 MMCF per year with the same long-term sustained yield. Thus long-term sustained yield is decreased by 3.4 MMCF with the 25 percent departure constraint.

3. Timber Harvest and Mountain Pine Beetle Impacts

The maximum possible timber production levels with mountain pine beetle infestations in lodgepole pine stands are modeled by the maximum timber benchmark increment 3. This run replicates the maximum timber benchmark but uses timber yield tables which model reduced green timber volumes as a result of anticipated mountain pine beetle infestations. The purpose of this increment was to show the potential timber volume losses and costs associated with the mountain pine beetle infestation. First decade harvest would be 14.9 MMCF compared to the 24.5 MMCF of the maximum timber benchmark.

4. Livestock Forage Production

Livestock forage production is maximized in the maximum livestock benchmark. Optimal production of forage occurs on rangeland with investment in range improvements and on transitory rangeland through timber harvest which, in this benchmark, is allowed to depart from nondeclining even flow to achieve the greatest outputs in forage over the planning horizon. First decade forage outputs are 231,000 AUM's per year, with a peak in decade two of 264,800 AUM's per year.

The utilization levels in this benchmark are structured to favor livestock grazing; they were revised during alternative development to ensure provision of forage for wildlife and for protection of watershed and plant vigor.

The livestock forage production levels associated with the maximum PNV benchmark are those that are most cost-efficient given a nondeclining flow constraint. Any forage produced beyond the maximum PNV benchmark level is produced with uneconomical range investments or as a result of timber harvest that departs from nondeclining flow. Livestock AUMS's produced in the maximum PNV benchmark are 180,000 AUM's per year in decade one with a peak of 204,000 AUM's per year in decade four.

The costs of producing the forage modeled by the maximum range benchmark are at least 20 percent higher than the cost of producing the forage modeled by the maximum PNV benchmark.

5. Sensitivity to Dispersed Recreation Values

The management prescriptions constructed for the Beaverhead NF were developed in such a way that all include similiar values for dispersed recreation; therefore, prescription assignments are not significantly influenced by, and are insensitive to the dispersed recreation values. The dispersed recreation values do contribute to the calculation of PNV, however. The PNV differences between the maximum PNV benchmark and the maximum PNV (market values only) benchmark are entirely due to the nonmarket values, specifically dispersed and wilderness recreation values. The maximum PNV (market values only) benchmark has $75 million (25 percent) less PNV than the maximum PNV benchmark.

6. Minimum Management Requirements

Minimum management requirements are met through the management activities scheduled in the management prescriptions and through the nondeclining flow and ending inventory constraints used in the analysis. Where nondeclining flow of timber harvest is not required, a harvest constraint was employed that limited the amount of harvest occurring per decade in each planning unit (level I identifier for analysis areas). This distributed the harvest over space and time avoiding unacceptable impacts on soil and water (see the discussion of Minimum Management Reguirements in Section VI.)

7. Current Direction

The economic tradeoffs of implementing Current Direction with no budget constraint is analyzed by comparing the maximum PNV benchmark to the Current Direction benchmark. The opportunity cost of implementing Current Direction is $98 million. Much of this is associated with the implementation of a managment regime that was developed without cost-efficiency as the primary objective. Present value costs are similiar (Current Direction is $18 million less than maximum present net value), but present value benefits are substantially less under Current Direction ($ 116 million less). The timber revenues are the source of the difference--reflecting the difference between the long-term sustained yield of Current Direction (10.2 MMCF per year) and the long-term sustained yield of the maximum present net value benchmark (17.3 MMCF per year. These economic tradeoffs were the consequences of meeting current roadless and wilderness area study designations, visual quality objectives and wildlife habitat protection constraints.

E. Relationships Among Resources

1. Wilderness Management and Timber Harvest

Timber harvest levels and roadless/wilderness designations are inversely related. The interrelationship between wilderness management and scheduled timber harvest and suitable timber acreage is defined by comparing the maximum wilderness benchmark, the maximum timber benchmark, and the maximum PNV benchmark. The maximum wilderness designation is 1,406,000 acres, or approximately 66 percent of the Forest. The total tentatively suitable timber land base of 809,400 acres (as displayed in the maximum timber benchmark) is reduced by 57 percent if all roadless areas are recommended for wilderness classification. The maximum PNV benchmark has a suitable land base of 730,600 acres, representing an acreage that is defined by cost-efficiency with a nondeclining flow constraint. The difference between this acreage and the suitable acreage of the maximum wilderness benchmark is 347,000 acres, a 52 percent difference. The difference between the suitable land base of Current Direction (506,700 acres) and the maximum wilderness benchmark is about 159,600 acres, a 31.5 percent decrease.

One of the tradeoffs associated with the maximum wilderness benchmark is that timber long-term sustained yield is reduced 9 MMCF (52 percent) from that of the maximum PNV benchmark. It is a 63 percent reduction from the long-term sustained yield of the maximum timber benchmark. However, the long-term sustained yield of the maximum wilderness benchmark is only 1.9 MMCF (5.8 MMBF) less than the long- term sustained yield of Current Direction (a 19 percent reduction.) The maximum wilderness benchmark schedules harvest for 23.2 MMBF per year in decade one while Current Direction schedules 30.2 MMBF per year. Generally, in the maximum wilderness benchmark harvest will be scheduled in areas that have already been accessed and developed.

The reduced suitable timber land base of the maximum wilderness benchmark with the associated reduction in timber harvest volume results in a PNV of $180 million, and an opportunity cost of $118 million. The PNV is $20 million less than the PNV of Current Direction. The benefits associated with the timber resource in the maximum wilderness benchmark are reduced 50 percent, or $155 million from the maximum PNV benchmark.

The mix of resource uses and prescription assignments which mrximize PNV (with both market and nonmarket values included) is one with no wilderness designation beyond those areas already classified and with 59 percent of the potential long- term sustained yield. If only market values are utilized in calculations of PNV, the mix of resource uses does not change significantly.

2. Wilderness management and Recreation

The capacity of the existing classified wilderness is adequate to accomodate expected use as demonstrated by the maximum PNV benchmark. This does not take into account the diversity and quality of the wilderness recreation experience, however. The maximum wilderness benchmark provides far more wilderness recreation opportunities than will be used given projected use levels and expands the range of settings and types of experiences that are available.

3. Timber Harvest/ Livestock Forage

Livestock forage production levels can be increased if timber harvest is used to create transitory range. Production levels at and above about 190,000 AUM's include contributions of transitory forage. Transitory forage contributions may be overstated however depending upon the location and timimg of forage availability. While forage may be available, it may not be useable given the existing situation with used allotments, permitees' needs, and so on.

Maximum forage production levels are 231,000 AUM's per year in decade one and 208,000 AUM's per year in decade five with a peak in production of 264,800 AUM's per year in decade 2. The average annual production would be 225,000 AUM's per year over the planning horizon. Maximum production requires a departure from nondeclining flow of timber harvest to optimize range values.

4. Livestock Forage/ Roadless and Wilderness Designation

Livestock forage currently being utilized will continue to be available in roadless areas and recommended or wilderness areas, however, transitory range would not be available because no timber harvest would be allowed. Forage production would be limited to that available with existing improvements; that is no new improvements would be acceptable. Forage produced when all roadless areas are recommended for wilderness classification is less than that produced if production is maximized. Potential AUM's in the maximum wilderness benchmark are 178,000 per year in the first decade compared to 180,000 AUM's per year in the maximum PNV benchmark, and 231,000 AUM's per year in the maximum range benchmark. Thus, the maximum wilderness benchmark provides 99 percent of the AUM's of the maximum PNV benchmark.

5. Roadless and Wilderness Designations/ Elk Productivity

Roadless and wilderness designation reduces the opportunities available to maintain or enhance the habitat components used by elk but on the other hand, this designation provides a measure of habitat security not found in developed areas of the Forest. Wilderness classification is more restrictive than roadless management in that use of prescribed fire is limited to protection of the wilderness ecosystem, not always synonymous with enhancement of elk habitat. The old growth habitats that evolve over time in wilderness areas are not the habitats favored by elk.

6. Wilderness Designation/ Minerals

The impacts of roadless and wilderness designation on opportunities to explore for and develop mineral resource can be defined by evaluating the maximum wilderness benchmark's access limitations as they affect areas of very high or high energy and non-energy mineral favorability. In this benchmark, about 331,000 acres of the Forest with high energy mineral favorability (15%) would be recommended for wilderness classification and withdrawal from mineral entry. Approximately 330,000 acres of the areas recommended for wilderness classification have high non-energy mineral favorability. Thus, 15 percent of the Forest's acres with high non-energy mineral favorability would be withdrawn.

7. Wilderness Designation/ Motorized Recreation

A large portion of the Beaverhead NF is utilized by motorized recreationists, either trailbikes, jeeps, or snowmobiles. Classification of 66 percent of the Forest as wilderness in the maximum wilderness benchmark removes substantial recreational opportunities from this category of recreationist. Some areas are not used by these recreationists due to existing motorized use closures (implemented in response to resource damage) or inaccessible terrain.

F. Production Potential

The benchmarks provide information about production and economic potential of the Forest. This section specifically discusses the maximum production potential for key resources on the Beaverhead NF as well as the cost-efficient production potential for key resources.

1. Economic Potential of Market and Nonmarket Values

(Maximum PNV benchmark and Maximum PNV benchmark, increment II)

The maximum PNV of the Beaverhead NF with non-declining yield and minimum management requirements is 298 million dollars, about 135 dollars per acre. Timber management is cost-efficient on 730,600 acres, 90 percent of the tentatively suitable lands. Lands tentatively suitable but not cost efficient are generally over 45% slope. PNV is maximized by scheduling timber harvest so that harvest of stands that are mature can be scheduled in the early decades, when the cost/benefit ratio is high and an additional harvest can be scheduled within the planning period. Timber harvest starts at 55.4 MMBF per year in decade one and remains at that level. Long term sustained yield is 51.9 MMBF.

The maximum PNV of the Beaverhead NF without non-declining yield but with sequential bounds limiting fluctuations in harvest between decades to 25 percent is $355 million, about 162 dollars per acre as demonstrated by the maximum PNV benchmark, increment II. The suitable land base is 730,580 acres, very similiar to the maximum PNV benchmark. Timber harvest starts at 124.8 MMBF per year in decade one, falls to 39.6 MMBF per year in decade five, decreases to 22.9 MMBF in decade ten, with a long term sustained yield of 41.7

MMBF. Long term sustained yield is lower than if non-declining flow is required, in large part due to using lower intensity timber management prescriptions.

2. **Economic Potential of Market Resources**

(maximum PNV benchmark, market values only)

The maximum PNV of the Forest when timber, livestock forage, and developed recreation are assigned monetary values under nondeclining yield and meeting minimum soil, water, and old growth requirements is $223 million, 104 dollars per acre. That is a PNV that is 77 percent of the maximum PNV with both market and nonmarket values included in the calculations. Timber management is efficient on the same suitable timberland.

3. **Fixed Costs of Public Land Ownership**

(minimum level benchmark)

The minimum annual budget for the Forest is $2.9 million for the first decade and slightly lower for decades five through fifteen. The present value of the costs is $72 million.

Outputs which are incidental to management include timber and livestock grazing under contracts, recreation use, and elk forage. Timber harvest, road construction, and livestock grazing activities are limited to compleating current contracts. Recreation use would be restricted as trails, roads, and facilities are closed. The present value benefits of these outputs is 81 million dollars of which 68 million dollars in benefits are associated with recreation, 13 million dollars with livestock grazing, and less than a million dollars with timber. The present net value of minimum management is 9 million dollars.

4. **Timber Potential**

(maximum timber benchmark)

The maximum first decade harvest under nondeclining yield is 19.8 MMCF/year (53.5 MMBF/year). This harvest level is increased over the 150-year planning period to a long term sustained yield of 22.7 MMCF (68.1 MMBF). Timber management is scheduled for about 99 percent of the tentatively suitable timberland (804,200 acres of 809,600 acres). All of the suitable timber base is assigned to timber emphasis prescriptions; the majority to high or moderate intensity prescriptions. The PNV is $213 million, with an opportunity cost of $85 million.

5. **Wilderness Potential**

(maximum wilderness benchmark)

The maximum wilderness designation is 1,416 million acres or 66 percent of the Forest. This includes those areas already classified Wilderness (the Anaconda-Pintler and Metcalf Wildernesses) but excludes the West Pioneer MWSA which was recommended for nonwilderness management in a separate EIS. The discounted cost of Forest management with the optimal level of wilderness management is 120 million dollars or 61 dollars per acre. The PNV is 180 million dollars, with an opportunity cost of 118 million dollars.

Timber harvest starts at 8.3 MMCF/year (25.7 MMBF/year) and is sustained at that level with the same long term sustained yield. Timber management is scheduled for 43 percent of the tentatively suitable timberland,which can be assumed to be the suitable land that has already been accessed (i.e. roaded). Timber harvest is concentrated in areas that have already experience extensive development and large areas are scheduled with no regard for other resource concerns such as wildlife habitat, or fisheries.

6. Range Potential

(maximum livestock forage benchmark)

The maximum livestock forage converts to an average 225,000 AUM's per year, with 231,000 AUM's produced per year in decade 1. Optimal production of forage occurs on permanent rangeland with investment in range improvements and on transitory range created through timber harvest. Range forage potential at and beyond about 190,000 AUM's is associated with transitory forage. Optimal forage production requires intensive and extensive management of permanent rangeland, departure from non-declining even flow and large harvest units to create transitory range forage.

7. Elk Winter Range Forage Potential

(maximum wildlife forage benchmark)

This benchmark focuses on the elk habitat production potential for the Forest. The benchmark analysis indicates that winter range is the limiting factor in managing for elk populations. Summer range is more than adequate to sustain the number of elk that can be supported on winter range. The maximum wildlife habitat potential benchmark established a supply potential for the Beaverhead Forest that provides a winter range capacity of 7700 elk if all the permitted livestock were removed from winter range. The Montana Department of Fish, Wildlife and Parks has estimated that approximately 7500 elk are currently wintering on other ownerships adjacent to the Beaverhead Forest. This results in a potential winter range capacity of 15,200 elk on the overall winter range.

8. Resource and Economic Potential Under Current Management

(Current Direction)

Continuing current management on the Forest with no budget constraint provides for a timber harvest level that starts at 10 MMCF per year (37.6 MMBF per year) and continues at that level throughout the planning horizon. The long term sustained yield is 10.2 MMCF (29 MMBF). Sixty-six percent of the tentatively suitable timberland is defined as suitable for timber management.

The range program would continue at 190,000 AUM's with the potential of more transitory forage available.

The PNV of Current Direction is 200 million dollars, with an opportunity cost of 98 million dollars.

VII. Formulation of Alternatives

A. Overview

A Forest plan alternative is a mix of management prescriptions applied in specific amounts and locations to achieve a desired management emphasis expressed in a goal and objectives. According to NFMA (36 CFR 219.12f) alternatives must:

- Be within the maximum and minimum resource potential of the Forest to provide a full range of resource outputs and expenditure levels.
- Be formulated to facilitate analysis of opportunity costs, resource use, and environmental tradeoffs among alternatives.
- Be formulated to facilitate evaluation of present net value, benefits, and costs of achieving various outputs and nonpriced benefits.
- Address and respond differently to major public issues, management concerns, and resource opportunities.
- Represent the most cost-efficient combination of management prescriptions to meet the objectives of the alternative.
- State the condition and uses that will result from long-term implementation.
- State what goods and services will be produced, including timing and flow of outputs, and the costs and benefits generated.
- State the resource management standards and guidelines.
- State the purposes of the proposed management direction.

Formulation of alternatives was planning step five which followed the analysis of the management situation. Benchmarks from the analysis of the management situation defined the range within which alternatives were developed. (See Section VI of this appendix). Two specific alternatives were required: one which responds to the RPA program targets, and another which reflects current and future level of goods and services if current management was continued with existing budget levels (the no-action alternative). This Final EIS displays the Preferred Alternative which was built following public review of and comment on the Revised Draft EIS. The Preferred Alternative is responsive to and incorporates public recommendations.

The process can best be resummarized as a series of steps.

Step I. Major public issues were identified through public involvement. Internal management concerns were added to the list of issues. For additional discussion of this step, see Appendix A). The issues and concerns were reviewed by an interdisciplinary team and consolidated into a set of planning questions to be addressed by the benchmarks and alternatives. See Table B-15 for a comparison of how the Alternatives respond to the issues and concerns.

Table B-15

Present Net Value and Indicators for the Issues Addressed by the Alternatives

	Unit of Measure	Alternatives A	B	C	D	F	G	H	H Dept.	I	W	S
Present Net Value	MM$	196	244	170	136	200	249	157	172	180	207	140
Domestic Livestock Grazing decade I	M AUM's	190	184	182	186	192	185	192	199	178	195	190
Base Timber Sale Schedule-decade I	MMBF	29.4	33.8	25.8	18.8	36.2	43.6	20.6	31.6	28.2	37.6	17.3
	MMCF	8.9	10.9	8.9	5.7	11.3	13.2	7.1	11.3	8.3	11.4	5.8
Long term sustained yield	MMBF	31.3	49.2	42.3	18.6	35.3	41.2	33.3	40.2	25.7	35.7	32.1
	MMCF	10.8	16.4	14.1	6.0	11.4	13.3	10.4	13.4	8.3	11.5	9.3
Suitable timber-land	acres	535.3	652.5	537.2	313.1	609.3	547.6	378.5	378.5	347.1	615.8	338.3
Recreation management Roadless areas (nonwilderness)	M acres	1000.4	1044.9	281.4	672.1	656.1	1051.3	1106.3	1106.3	173.5	784.2	1136.4
Wildlife habitat Elk effective cover												
decade I	M acres	1114	1099	1118	1140	1098	1105	1128	1111	1136	1097	1140
decade V	M acres	973	887	921	1078	982	971	1005	965	1038	983	1040
Fisheries Potential Streams												
decade I	M fish	334.0	334.8	334.4	337.1	334.0	335.1	337.8	336.6	337.8	334.0	337.9
decade V	M fish	326.5	331.5	326.6	335.6	330.7	329.3	336.9	334.0	337.2	330.7	341.1
Road construction Additional miles needed for management	miles	3550	4324	3570	1965	4103	3550	2452	2490	2225	4154	2143
Roads constructed decade I	miles/yr	52.4	63.5	53.3	29.7	60.6	53.3	37.8	43.6	33.2	61.0	33.8
decade V	miles/yr	36.5	44.6	36.7	20.1	42.3	36.4	25.0	29.3	22.8	42.9	21.7
Wilderness	acres	337.7	173.5	1107.2	945.9	620.2	235.5	337.3	337.3	1415.6	488.8	342.9

Step II. A comprehensive multi-resource data base was formulated based on the identified issues and concerns and stored in a computer retrevial system.

Step III. Land analysis areas with similiar physical and biological attributes were identified and mapped. The capability, suitability and management opportunities of specific areas of the Forest were considered in this step.

Step IV. A set of management prescriptions were prepared to represent a variety of possible ways and intensities to manage the Forest.

Step V. The 595 analysis areas identified in step IV were assigned management prescriptions. Some analysis areas were assigned only one prescription (such as classified Wildernesses) while others were assigned a variety of prescriptions, the variety limited only by the capability and suitability of the analysis area. Single prescription assignments limited the model's choices, so the use of single prescriptions was very limited.

Step VI. Resource outputs and the associated costs and dollar values that would result when a prescription was implemented were calculated and entered into the FORPLAN computer model.

Step VII. Demand or estimates of public consumption was estimated for the resources associated with the planning questions developed in step I.

Step VIII. Supply potentials were determined using the FORPLAN computer model. Various assumptions, constraints, and objectives were used to establish benchmarks for supply potentials of each resource. Benchmarks were established for the minimum, maximum, and constrained resource levels, and for maximum present net value. Existing resource supply and projected demand were compared to supply potentials expressed in the benchmarks. Opportunities to resolve issues and management concerns were identified for each resource by comparing existing and projected demand to potential production levels. These potentials, when compared to Current Direction, indicate the available opportunities and/or need for change. This step concluded the analysis of the management situation.

Step IX. Alternative objectives were established to provide a broad range of options for future management of the Forest. Descriptions were written to define the resource management intent of each alternative. Eleven alternatives were displayed to the public in the Revised Draft EIS. Two additional alternatives, S and Sa were developed following the public review of the Revised Draft from the previous eleven alternatives. The Proposed Action displayed in the Revised Draft was changed enough to warrent development and display of new alternatives (S and Sa are iterations of the same Proposed Action). The new alternatives are within the range of major resource outputs presented in the Revised Draft EIS.

Step X. The FORPLAN model was again used to estimate the outputs and costs for each alternative by reflecting the objective of the alternative through a given set of constraints. This step was repeated as necessary to assure the constraints properly reflected the objective of the alternative.

Step XI. The results of the FORPLAN analysis for each alternative were evaluated to assure conformance with laws, policies, and guidelines. Refinements were made to insure that each alternative could be implemented.

Cost efficiency was incorporated in the planning process by the interdisciplinary team by first identifying the more cost efficient management prescriptions. Second, the interdisciplinary team developed different alternatives and identified the constraints necessary for addressing specific objectives, issues, and management concerns. Third, management prescriptions meeting the cost efficiency test were combined with the necessary constraints and incorporated into the FORPLAN model to form different alternatives. Each alternative produces a different combination of priced and nonpriced outputs. The feasibility of implementing each alternative is analyzed within FORPLAN and external to FORPLAN as prescription assignments and production levels are evaluated. Within FORPLAN, all constraints must be satisfied or an infeasibility will result.

The constraints applied to each alternative in the FORPLAN analysis (step X) are discussed in detail in the following section. Note that in the Alternative descriptions and in the previous Benchmark dicsussions an iterative type of analysis is incorporated (ie. sequential analysis that answers questions on tradeoffs and explores alternative approaches to meeting objectives).

B. Common Constraints

The constraints applied to all alternatives resulted from NFMA regulations (36 CFR 219), administration policy, and suitability criteria for application of prescriptions (see the Forest planning records). Constraints common to all alternatives are as follows:

1. Constraint: All alternatives except the departure analysis (alternative H-departure) require non-declining harvest flow. That is, the quantity of timber which can be sold from the Beaverhead Forest each decade must be equal to or less than the quantity which can be removed from the Forest annually in perpetuity on a sustained yield basis and greater than or equal to the volume offered for sale in the preceding decade.

Purpose: To provide a sustained yield of wood products.

Rationale: This constraint assumes a constant or upward trend in timber supply.

Tradeoff: Non-declining flow reduces PNV by limiting the flexibility of the timber harvest schedule. The maximum PNV benchmark, increment 2, which allowed departure (fluctuations in base sale schedule of 25 percent between decades) had a PNV $57 million higher than the maximum PNV benchmark (19 percent higher). This occurs because higher value mixed conifer stands can be scheduled for harvest in decades 1, 2, and 3, when net stumpage values can be maximized with a downfall in harvest in decades 4 and 5.

2. Constraint: All alternatives utilize an ending inventory constraint to insure an appropriate level of timber inventory at the end of the planning horizon.

Purpose: To ensure that harvestable timber will be available in the decades immediately following the end of the planning horizon;i.e. to avoid liquidation of the timber resource within the timeframe of the analysis.

Rationale: This constraint assumes the need for a future sustained yield of timber from National Forest lands.

Tradeoff: The ending inventory constraint reduces PNV by limiting the flexibility of the timber harvest schedule during the planning period. This constraint requires timber harvest opportunities to be available throughout and beyond the planning horizon, not allowing full utilization of the timber available in the decades when net stumpage values could be maximized. The ending inventory constraint also precludes creation of permanent rangeland through timber harvest.

3. Constraint: Limit prescriptions available for selection in riparian zones to two riparian prescriptions.

Purpose: To limit timber harvest options to selection harvest.

Rationale: This constraint is needed to meet NFMA requirements for protection of riparian areas (219.27 (e)).

Tradeoff: Riparian zone protection reduces PNV by limiting the amount of harvest of the more valuable timber grown on the Forest and by increasing logging and timber management costs due to the harvest methods allowed and the restricted amount of road construction.

4. Constraint: All alternatives ensure that 35 percent of the forage produced on critical elk winter ranges is available for elk utilization.

Purpose: To ensure that forage and security needs of overwintering elk populations are met on the Forest.

Rationale: The winter range prescription ensures that 35% of plant production is available for wildlife consumption, 35% is reserved from utilization to ensure plant vigor, and 30% is available for livestock grazing.

Tradeoff: This constraint reduces the amount of forage that could be available for utilization by domestic livestock on winter ranges. PNV is reduced because a priced resource output (livestock forage) is being traded off in order to produce a nonpriced output (elk numbers/hunting quality).

5. Constraint: In all alternatives road densities and logging systems are tied to land class and management prescription.

Purpose: To protect soil and water resources, meet management prescription objectives, and miminize costs.

Rationale: This constraint ensures linkage between roads and logging activities as the former are intended to provide support for the latter. Some soils and slopes are particularly sensitive and require miminum road densities; also the management objectives of prescriptions dictate road density.

Tradeoff: By requiring certain logging systems and road densities for specific land classes and prescriptions, harvest and management costs are generally increased (PNV reduced) over levels that could be achieved if less concern was given to soil and water protection.

6. Constraint: In all alternatives mimimum rotation ages for timber are allowed to occur at an age that is prior to 95% of culmination of mean annual increment (CMAI) .

Purpose: The CMAI constraint is used to ensure that timber is harvested at or beyond its maximum mean annual growth rate. On the Beaverhead, harvest is allowed just prior to CMAI to ensure that harvest is allowed in time to forstall the adverse impacts to the timber resource of mountain pine beetle induced mortality and to maximize economic returns (with harvest occurring before mortality and insect impacts are significant).

Rationale: This constraint provides rotation ages that maintain high productivity and are responsive to the Forest Service Manual and the NFMA regulations (36 CFR 219.16(a)(2)(iii) while at the same time providing some opportunity to address the mountain pine beetle mortality. The NFMA regulations state that alternatives to harvest at CMAI can be evaluated if "it is reasonable to expect that overall multiple use objectives would be better attained".

Tradeoff: The rotation ages for regenerated stands of lodgepole allow harvest at age 90--CMAI occurs at approximately 110 or120. Roughly 25 percent of the stands are harvested prior to CMAI in the analysis. This constraint can affect PNV in a positive manner if the point at which PNV would be maximized occurs before CMAI, because harvest is allowed but not required prior to CMAI. The 25 percent harvested prior to CMAI are scheduled for harvest because the stands contribute positively to calculations of PNV.

7. Constraint: In all alternatives, lands classified as wilderness (the Anaconda-Pintler and Metcalf Wildernesses) or recommended for wilderness are not available for timber harvest.

Purpose: To model existing wilderness legislation or the implications of legislation that would be recommended.

Rationale: This constraint ensures that wilderness legislation would be complied with.

Tradeoff: No alternative portrays the economic effects of harvesting timber in the classified wildernesses, however, at least one alternative models every other roadless area with capable timberlands as available for timber harvest. A comparison of two increments of the maximum timber benchmark (increments 1 and 4) does indicate that PNV would likely be reduced from what it could be if additional capable lands within classified wildernesses were available and suitable for timber production. Capable lands within the Metcalf and Anaconda-Pintler Wildernesses are estimated to total 70,000 acres.

8. Constraint: In all alternatives livestock forage utilization of suitable rangeland ensures that at least 30% of the forage is reserved from consumption by livestock or wildlife.

Purpose: To provide for maintenance of plant vigor and limit potential for erosion from over-utilization of forage by domestic livestock.

Rationale: This constraint functions as an "ending inventory constraint" for forage, ensuring that productivity is maintained through the planning horizon.

Tradeoff: The flexibility in scheduling forage utilization is reduced and the intensity of grazing utilization is limited in the short term. The PNV implication is negative but the stewardship value of this constraint likely otuweighs any loss in PNV.

9. Constraint: In all alternatives except Current Direction, the West Pioneers Montana Wilderness Study Area (MWSA) is modeled as "nonwilderness", the recommended alternative of the Taylor-Hilgard, Mt. Henry, West PioneerM WSA DEIS. This nonwilderness alternative has been refined through the forest planning process and is expressed in all alternatives. Current Direction displays the West Pioneers as a WSA. Alternative H, the Proposed Action, models the West Pioneers as nonwilderness (similiar to the other alternatives) while Alternative Ha models the area in custodial management, which it will be in until Congress acts.

Purpose: The MWSA DEIS was a site specific analysis of the wilderness and nonwilderness attributes and options for the West Pioneers and this planning analysis does not seek to duplicate that effort but rather will incorporate it.

Rationale: The recommendation of the MWSA DEIS was the recommendation of the Forest Service therefore it is appropriate to incorporate it here.

Tradeoff: By incorporating the recommendation of the MWSA DEIS, the wilderness/nonwilderness analysis is not redone and the nonwilderness designation stands (with the Current Direction exception). This constraint actually increases potential PNV by ensuring that these lands can be considered for development by the FORPLAN model. The Current Direction Alternative and Alternative Ha, by removing this area from development consideration, reduce the potential PNV.

10. Constraint: Recreation RVD's produced through the prescriptions and investments of the alternatives are valued only up to the expected levels of demand for the recreational opportunity, not in terms of recreation potential.

Purpose: The constraint must be used to avoid assigning dollar values to areas that would provide recreation opportunities in excess of what is likely to be used.

Rationale: The "willingness to pay" values should be quantified based on projected and anticipated use not in terms of simple carrying capacity, which may never be used.

Tradeoff: Because all alternatives provide capacity for recreational activities in excess of projected demand, none of the alternatives vary in the contribution to PNV provided by recreation as demand does not change by alternative.

C. Development of Alternatives

1. **Alternative A** (Current Level of management)

The goal of this alternative is to continue the management direction provided by the 1978 Beaverhead Land Management Plan. The alternative also maintains experienced budget levels. The current level alternative meets the NEPA and NMFA reguirements for development of a "no action" alternative, with no change from existing direction for resource production and management.

The criteria and assumptions underlying the development of this alternative are:

a. Reflect the decisions of RARE II, recommending some areas for wilderness, retaining some as further planning, and assigning the remainder to nonwilderness prescriptions.

b. Maintain the West Pioneer Wilderness Study Area (WSA) as a WSA, protecting the wilderness character of the area.

c. To the extent possible, given budget levels, emphasize dispersed recreation opportunities, with priorities on monitoring and controlling any use above an acceptable carrying capacity level. Trail construction would be very limited.

d. Maintain elk habitat on winter ranges, but not in summer range areas where other resource uses will have impacts on elk habitat effectiveness.

e. Maintain current allotted livestock use of permanent rangeland.

f. Strive to maintain the current scheduled timber harvest program, however, recognize the limitations imposed by budget constraints.

The constraints used to meet the criteria and assumptions are:

a. Assign areas recommended for wilderness in RARE II to a wilderness prescription and further planning areas to a wilderness study prescription.

Purpose: To meet the requirement of the RARE II effort.
Rationale: To meet the requirements of the current land management planning effort and to correctly model what management direction would have been.

b. Assign the West Pioneer Wilderness Study Area to a WSA prescription.

Purpose: To meet the reguirement of the Montana Wilderness Study Act.

Rationale: To meet the requirements of the current land management planning effort and to correctly model what management direction was.

c. Assing all other areas of the Forest to management prescriptions that most closely reflect the management direction specified in the 1978 Land Management Plan. Allow the option of assignment to minimum level management to allow the flexibility neccessary given the budget constraint. Ensure that assignments strive to meet the current timber program by first maximizing timber production through Forplan, then maximizing PNV to ensure cost-efficiency.

Purpose: To meet the requirements of the "no action" alternative in representing what continuation of current management direction would mean, given both the proposed land uses of the 1978 plan and the experienced budget levels.

Rationale: The prescriptions for this planning effort are similiar if not replicas of the management direction in the 1978 Land Management Plan, therefore use of them to model this alternative best provides comprability between alternatives as well as a representation of current direction.

d. Assign the acreage now classified as the Metcalf Wilderness to a wilderness prescription, and remove the land traded to the Bureau of Land Management and private land holders through the legislation from the National Forest System land base. Include also other scattered changes in land ownership that have occurred over the last 6 years, since completion of the 1978 Land Mangement Plan.

Purpose: To portray the changes the landownership that have occurred since 1978, and to reflect the classification of the Metcalf Wilderness in 1983.

Rationale: Land classification and ownership has changed since the completion of the 1978 Land Management Plan and current direction would have to accomodate these changes.

e. Use a budget constraint equivalent to the Beaverhead NF's average budget for the period 1980-1982.

Purpose: To comply with Washington Office direction (see letter from the Chief, May 31, 1983) and to reflect management most likely to be implemented in the future if current direction is followed.

Rationale: An average of three years of actual budgets should accurately forecast future budgets.

2. Alternative B

The goal of this alternative is to maximize present net value while achieving high commodity resource production levels. This alternative is responsive to the 1980 RPA Program objectives, particularly in the range and timber resources. This alternative does not recommend any additional wilderness classification for the Beaverhead NF.

The criteria and assumptions underlying the development of this alternative are:

a. Emphasize timber production and livestock forage on suitable lands.

b. Recommend no roadless areas for wilderness classification.

c. Meet or exceed RPA objectives for range and timber for the next 50 years.

d. Place only limited attention on non-commodity resources; with no additional investment in recreational facilities, and recreation management focused on motorized opportunities.

e. Provide a high level of access opportunities for mineral exploration and development.

f. Manage the West Pioneers for nonwilderness purposes, as per the Montana Wilderness Study Area DEIS.

The constraints used to meet the criteria and assumptions are:

a. Assign no roadless areas to wilderness prescriptions.

Purpose and rationale: To ensure an array of alternative approaches to the roadless resource issue.

b. Require livestock forage and timber outputs for the first fifty years to be plus or minus 10% of the 1980 RPA objectives.

Purpose: To ensure an alternative is considered that meets or exceeds the 1980 RPA Program.

Rationale: Timber and range were determined to be the resource areas where it would be most difficult to achieve the 1980 RPA objectives. Therefore, constraints were used to ensure that RPA objectives were meet in at least one alternative. A range of variation was used (plus or minus 10%) to facilitate achievement of an optimal solution in the FORPLAN analysis.

c. Assign the West Pioneers to the mix of nonwilderness management prescriptions specified in the 1982 Land and Resource Management Plan.

Purpose and Rationale: The Montana Wilderness Study Area (MWSA) DEIS for the Taylor-Hilgard, Mt. Henry, and West Pioneer areas recommended nonwilderness management for the West Pioneers. This recommendation was reflected in the proposed land uses of the draft 1982 Land and Resource Management Plan for the Beaverhead NF which has been reviewed by the public. This nonwilderness management direction for the West Pioneers roadless area is carried through all alternatives except Alternative H in this analysis because it represents a site specific analysis of the roadless attributes and wilderness characteristics of the area (conducted in the MWSA process) that does not need to be repeated here. This would be the management for the area if Congress releases the area from wilderness consideration.

3. Alternative C

The goal of this alternative is to maximize present net value while providing both a significant acreage of roadless area recommended for wilderness and a significant production level for commodity resources from the remainder of the Beaverhead NF. This alternative is responsive to the 1980 RPA objectives and also provides for wilderness classification of 75% of the roadless areas.

The criteria and assumptions underlying the development of this alternative are:

a. Emphasize livestock forage and timber harvest on suitable lands.

b. Recommend a significant proportion of the roadless resource for wilderness classification.

c. Meet or exceed the 1980 RPA objectives for the next fifty years.

d. Limit emphasis on amenity resources to the areas that are recommended for wilderness.

e. Provide a high level of access for mineral exploration and development on National Forest lands that are not recommended for wilderness classification.

f. Manage the West Pioneers for nonwilderness purposes, as per the Montana Wilderness Study Area DEIS.

The constraints used to meet the criteria and assumptions are:

a. Assign 75% of the roadless areas to wilderness prescriptions.

Purpose and rationale: To ensure an array of alternative approaches to the roadless resource issue and to evaluate opportunities on the Beaverhead NF for providing high levels of both commodity outputs and wilderness.

b. Require livestock forage and timber outputs for the first fifty years to be plus or minus 10% of the 1980 RPA objectives.

Purpose: To ensure an alternative is considered that meets or exceeds the 1980 RPA Program and that evaluates the compatibility between commodity outputs and wilderness.

Rationale: Timber and range were determined to be the resource areas where it would be most difficult to achieve the 1980 RPA objectives. Therefore, constraints were used to ensure that RPA objectives were meet in at least one alternative. A range of variation was used (plus or minus 10%) to facilitate achievement of an optimal solution in the FORPLAN analysis.

c. Assign the West Pioneers to the mix of nonwilderness management prescriptions specified in the 1982 Land and Resource Management Plan.

Purpose and Rationale: The Montana Wilderness Study Area (MWSA) DEIS for the Taylor-Hilgard, Mt. Henry, and West Pioneer areas recommended nonwilderness management for the West Pioneers. This recommendation was reflected in the Proposed land uses of the draft 1982 Land and Resource Management Plan for the Beaverhead NF which has been reviewed by the public. This nonwilderness management direction for the West Pioneers roadless area is carried through all alternatives except Alternative H in this analysis because it represents a site specific analysis of the roadless attributes and wilderness characteristics of the area (conducted in the MWSA process) that does not need to be repeated here. This would be the management for the area if Congress releases the area from wilderness consideration.

4. Alternative D

The goal of this alternative is to maximize present net value while emphasizing recreation opportunities and the protection and maintenance of elk habitat. This alternative focuses on the amenity resources, such as recreation and wildlife, by restricting timber harvest to areas that have already been developed and by recommending about 62 percent of the roadless areas on the Beaverhead NF for wilderness classification.

The criteria and assumptions underlying the development of this alternative are:

a. Recommend a major portion of the roadless resource for wilderness classification, with particular emphasis on those areas with high wilderness and wildlife attributes.

b. Give management priority to elk "security" areas, especially winter ranges and calving areas. Ensure that adequate hiding cover is provided throughout the forest.

c. Increase developed campground capacity in areas that have domonstrated patterns of heavy use.

d. Limit areas of timber harvest to those areas already accessed by roads.

e. In areas assigned timber management prescriptions, concentrate the timber harvest program on high value stands.

f. Manage the West Pioneers for nonwilderness purposes, as per the Montana Wilderness Study Area DEIS.

The constraints used to meet the criteria and assumptions are:

a. Assign 62 percent of the roadless areas to wilderness prescriptions.

Purpose and rationale: To ensure an array of alternative approaches to the roadless resource issue.

b. Utilize a constraint that allows for an extension of the rotation age in all the regenerated timber prescriptions so that hiding cover can be provided for elk. In combination with this constraint, restrict the acreage of harvest by decade to ensure that cutting units and harvest activities can be distributed in a manner that protects hiding cover.

Purpose: To adequately model elk habitat security impacts on timber harvest and associated costs and to assure that the timber harvest schedule would be implementable given this alternative's wildlife emphasis.

Rationale: Maintenance of elk security requires increased flexibility in the timber harvest schedule, with extended rotations and increased dispersal of harvest.

c. Constrain access for timber harvest activities to those areas already roaded (that is, those analysis areas identified in the level 2 identifier as ALLDEV).

Purpose: To maintain the roadless areas without necessarily designating them wilderness, the FORPLAN model had to be prevented from accessing undeveloped areas.

Rationale: Opportunities for backcountry but non-wilderness recreation are of high priority in this alternative.

d. Require assgnment of wildlife prescriptions in developed areas determined by spacial fitting to be high priority wildlife areas.

Purpose: To adequately model the costs and benefits of enhancing and protecting wildlife habitat on the Beaverhead NF. Also, to recognize the specific wildlife values of developed areas identified by line officers in the spacial fitting of alternatives.

Rationale: Protection of wildlife values in some areas requires use of wildlife prescriptions which incorporate management practices designed to enhance and protect wildlife habitat.

e. Assign the West Pioneers to the mix of nonwilderness management prescriptions specified in the 1982 Land and Resource Management Plan.

Purpose and Rationale: The Montana Wilderness Study Area (MWSA) DEIS for the Taylor-Hilgard, Mt. Henry, and West Pioneer areas recommended nonwilderness management for the West Pioneers. This recommendation was reflected in the proposed land uses of the draft 1982 Land and Resource Management Plan for the Beaverhead NF which has been reviewed by the public. This nonwilderness management direction for the West Pioneers roadless area is carried through all alternatives except Alternative H in this analysis because it represents a site specific analysis of the roadless attributes and wilderness characteristics of the area (conducted in the MWSA process) that does not need to be repeated here. This would be the management for the area if Congress releases the area from wilderness consideration.

5. Alternative F

The goal of this alternative is to maximize present net value while emphasizing active wildlife habitat improvement activities including timber harvest designed to enhance or maintain habitat components. This alternative also provides for timber harvest and livestock forage utilization where suitable. Where roadless area resource values, especially wildlife, can be best managed through wilderness classification, wilderness is recommended.

The criteria and assumptions underlying the development of this alternative are:

a. Wildlife and fisheries habitat improvement activities will be emphasized.

b. Competition between livestock and elk for forage on winter ranges will be minimized.

c. Timber harvest and livestock forage use will be allowed on suitable lands, with potential conflicts with wildlife reduced through investment in habitat improvement.

d. Recommend a portion of the roadless resource for wilderness classification.

e. Manage the West Pioneers for nonwilderness purposes, as per the Montana Wilderness Study Area DEIS.

The constraints used to meet the criteria and assumptions are:

a. Assign 36 percent of the roadless areas to wilderness prescriptions.

Purpose and rationale: To ensure an array of alternative approaches to the roadless resource issue.

b. Utilize a constraint that allows for an extension of the rotation age in the regenerated timber harvest associated with the wildlife prescriptions so that hiding cover can be provided for elk. In combination with this constraint, restrict the acreage of timber harvest by decade to ensure that cutting units and harvest activities can be distributed in a manner that protects hiding cover.

Purpose: To adequately model the impacts a concern about elk habitat security will have on timber harvest and associated costs and to assure that the timber harvest schedule would be implementable given this alternative's wildlife emphasis.

Rationale: Maintenance of elk security requires increased flexibility in the timber harvest schedule, with extended rotations and increased dispersal of harvest.

c. Require assignment of wildlife prescriptions in areas determined by spacial fitting to be high priority wildlife areas.

Purpose: To adequately model the costs and benefits of enhancing and protecting wildlife habitat on the Beaverhead NF. Also, to recognize the specific wildlife values of areas identified by line officers in the spacial fitting of alternatives.

Rationale: Protection of wildlife values in some areas requires use of wildlife prescriptions which incorporate management practices designed to enhance and protect wildlife habitat.

d. Assign the West Pioneers to the mix of nonwilderness management prescriptions specified in the 1982 Land and Resource Management Plan.

Purpose and Rationale: The Montana Wilderness Study Area (MWSA) DEIS for the Taylor-Hilgard, Mt. Henry, and West Pioneer areas recommended nonwilderness management for the West Pioneers. This recommendation was reflected in the proposed land uses of the draft 1982 Land and Resource Management Plan for the Beaverhead NF which has been reviewed by the public. This nonwilderness management direction for the West Pioneers roadless area is carried through all alternatives except Alternative H in this analysis because it represents a site specific analysis of the roadless attributes and wilderness characteristics of the area (conducted in the MWSA process) that does not need to be repeated here. This would be the management for the area if Congress releases the area from wilderness consideration.

6. Alternative G

The goal of this alternative is to maximize present net value with few constraints that detract from opportunities to manage in a cost efficient manner. Recommended additions to the wilderness system are limited to small areas that generally are adjacent to areas already classified.

The criteria and assumptions underlying the development of this alternative are:

a. Allow timber harvest and livestock forage utilization on all suitable areas where it is cost efficient to do so.

b. Use cost efficiency as the primary guide in the determination of prescription assignment and scheduling.

c. Recommend wilderness designation for limited acreages, where adjacent to existing wildernesses and/or where conflicts with commodity resource development opportunities can be minimized.

d.Provide a high level of access for mineral exploration and development on National Forest lands that are not recommended for wilderness classification.

e. Manage the West Pioneers for nonwilderness purposes, as per the Montana Wilderness Study Area DEIS.

The constraints used to meet the criteria and assumptions are:

a. Assign 5 percent of the roadless areas to wilderness prescriptions.

Purpose and rationale: To ensure an array of alternative approaches to the roadless resource issue and to maintain as many options as possible in this alternative for cost efficiency.

b. Provide a full array of prescriptions for each analysis area to ensure opportunities to maximize present net value.

Purpose and rationale: With an appropriately full array of management prescriptions, the Forplan model will assign prescriptions and schedule activities in a cost efficient manner.

c. Assign the West Pioneers to the mix of nonwilderness management prescriptions specified in the 1982 Land and Resource Management Plan.

Purpose and Rationale: The Montana Wilderness Study Area (MWSA) DEIS for the Taylor-Hilgard, Mt. Henry, and West Pioneer areas recommended nonwilderness management for the West Pioneers. This recommendation was reflected in the proposed land uses of the draft 1982 Land and Resource Management Plan for the Beaverhead NF which has been reviewed by the public. This nonwilderness management direction for the West Pioneers roadless area is carried through all alternatives except Alternative H in this analysis because it represents a site specific analysis of the roadless attributes and wilderness characteristics of the area (conducted in the MWSA process) that does not need to be repeated here. This would be the management for the area if Congress releases the area from wilderness consideration.

7. Alternative H

The goal of this alternative is to maximize present net value while responding to the variety of resouce use demands and concerns of the publics who utilize the Beaverhead NF lands and resources. This alternative meets demands for dispersed and developed recreation, while responding to concerns about wilderness designation in some of the more popular roadless areas. This alternative concentrates timber harvest activities in areas highly suseptible to mountain pine beetle infestations. Elk habitat security is maintained throughout the forest. The West Pioneers Wilderness Study Area is assigned a custodial management prescription.

The criteria and assumptions underlying the development of this alternative are:

a. Ensure maintenance of elk habitat security while allowing timber harvest and livestock grazing.

b. Meet public demands for dispersed recreation in non-wilderness settings.

c. Recommend wilderness classification for roadless areas that have received substantial support for designation and where conflicts with other uses, such as off road vehicles and mineral and oil and gas exploration and development are acceptable.

d. Maintain the West Pioneers Wilderness Study Area in custodial status, protecting the wilderness characteristics of the area pending a decision by Congress on the nonwilderness/wilderness status of the area.

e. Recognize the timber harvest activities that have occurred on the Madison District in response to the mountain pine beetle infestation.

The constraints used to meet the criteria and assumptions are:

a. Assign 13 percent of the roadless areas to wilderness prescriptions.

Purpose and rationale: To ensure an array of alternative approaches to the roadless resource issue, responsiveness to public comments on the roadless reevaluation "scoping" process, and to provide an alternative that designates for wilderness, the roadless areas most supported for wilderness classification but without major conflicts with other resources.

b. Utilize a constraint that allows for an extension of the rotation age in the regenerated timber harvest associated with the wildlife prescriptions. In combination with this constraint, restrict the acreage of harvest by decade to ensure that cutting units and harvest activities can be well distributed.

Purpose: To model the impacts a concern about elk habitat security will have on timber harvest and associated costs and to assure that the timber harvest schedule would be implementable given this alternative's wildlife emphasis.

Rationale: Maintenance of elk security requires increased flexibility in the timber harvest schedule, with extended rotations and increased dispersal of harvest.

c. Ensure that timber harvest in the first four decades focuses on the lodgepole pine stands that are highly suseptible to mountain pine beetle infestation by constraining 90 percent of the harvest to lodgepole pine stands.

Purpose: To salvage stands of lodgepole pine before mountain pine beetle related mortality reduces volume and value.

Rationale: Timber management of the old growth lodgepole pine stands on the Beaverhead NF requires immediate attention to the mountain pine beetle infestation, however the FORPLAN model tends to harvest the higher value mixed conifer (Douglas fir) stands before the lodgepole pine. A constraint forces a timber harvest schedule that more accurately reflects the management needed but has a negative impact on present net value.

d. Assign the West Pioneers to the custodial management prescription.

Purpose and rationale: The Congress must decide the wilderness/nonwilderness status of the West Pioneers Wilderness Study Area. Until that decision is made, the wilderness characteristics of the area must be maintained. If the area is classified wilderness (in spite of the Wilderness Study DEIS recommendation for nonwilderness) the custodial management prescription adequately serves as a model of wilderness management for the area.

e. Limit timber harvest in the first decade in the Madison area to respond to the timber harvest that has occurred within the last three years and to the amount of sold but uncut timber volume.

Purpose and rationale: By limiting the level of harvest in this area for the first decade, the concerns for water quality and elk security cover can be addressed. By the second decade timber harvest can be scheduled in such a manner that other resource values can be maintained.

8. Alternative H (departure)

The goal of this alternative is to replicate the goals and objectives of alternative H but to also incorporate a departure timber harvest schedule. The purpose of the departure schedule is to allow harvest of lodgepole pine stands suseptible to mountain pine beetle infestation to a degree not possible if non-declining flow constraints were used.

The criteria and assumptions underlying the development of this alternative and additional to those used to develop Alternative H are:

a. Explore opportunities to more adequately respond to the mountain pine beetle infestation by scheduling additional lodgepole for harvest in decades 1 through 3. (The departure analysis is responsive to 36 CFR 219.16 (a)(3)(ii)).

b. Allow deviation from wildlife objectives to ensure flexibility is provided in sceduling the timber harvest program.

c. Ensure the departure schedule has maximum flexibility but that linkages between decades and to the current situation are reasonable and implementable.

d. Maintain the West Pioneers Wilderness Study Area in custodial status, protecting the wilderness characteristics of the area pending a decision by Congress on the nonwilderness/wilderness status of the area.

The constraints used to meet the criteria and assumptions are:

a. Establish the following upper and lower bounds for the timber harvest schedule (MMCF):

Decade	Lower	Upper
1	9.0	11.3
2	9.0	13.5
3	9.0	13.5
4	9.0	13.5
5	9.0	11.3
6	6.8	11.3
7	4.5	11.3
8	4.5	11.3
9	6.8	11.3
10-15	9.0	11.3

Purpose: This constraint ensures that the departure schedule is linked between decades, allowing no more than a 20 percent change up or down.
This constraint also ensures that the first decade harvest is linked by the 20 percent fluctuation requirement to the existing harvest levels.

Rationale: To implement a departure requires flexibility in mill operations, and in Forest Service workforce management. This objective of this constraint is to allow additional early decade harvest of lodgepole pine stands while at the same time maintaining some stability for local timber industry and Forest workforce management.

b. Remove the constraint that allows for an extension of the rotation age in the regenerated timber harvest associated with the wildlife prescriptions. In addition, remove the constraint that restricted the acreage of harvest by decade to ensure that cutting units and harvest activities were distributed in a manner that protects hiding cover.

Purpose: To adequately model the departure opportunities associated with Alternative H, concerns about elk habitat security had to be reduced.

Rationale: Maintenance of elk security requires increased flexibility in the timber harvest schedule, with extended rotations and increased dispersal of harvest. This flexibility does not coincide with the flexibility needed to accelerate the harvest of lodgepole in the early decades of implementation.

c. Assign the West Pioneers to the custodial management prescription.

Purpose and rationale: The Congress must decide the wilderness/nonwilderness status of the West Pioneers Wilderness Study Area. Until that decision is made, the wilderness characteristics of the area must be maintained. If the area is classified wilderness (in spite of the Wilderness Study DEIS recommendation for nonwilderness) the custodial management prescription adequately serves as a model of wilderness management for the area.

9. Alternative HA

The goal of this alternative is to maximize present net value while responding to the variety of resouce use demands and concerns of the publics who utilize the Beaverhead NF lands and resources. This alternative meets demands for dispersed and developed recreation, while responding to concerns about wilderness designation in some of the more popular roadless areas. This alternative concentrates timber harvest activities in areas highly suseptible to mountain pine beetle infestations. Elk habitat security is maintained throughout the forest. The West Pioneers Wilderness Study Area is assigned nonwilderness management prescriptions specified in the 1982 Land Management Plan.

The criteria and assumptions underlying the development of this alternative are:

a. Ensure maintenance of elk habitat security while allowing timber harvest and livestock grazing.

b. Meet public demands for dispersed recreation in non-wilderness settings.

c. Recommend wilderness classification for roadless areas that have received substantial support for designation and where conflicts with other uses, such as off road vehicles and mineral and oil and gas exploration and development are acceptable.

d. Manage the West Pioneers under the nonwilderness management reommendation of the Montana Wilderness Study DEIS, with the management prescritions of the 1982 Land and Resource Management Plan.

The constraints used to meet the criteria and assumptions are:

a. Assign 13 percent of the roadless areas to wilderness prescriptions.

Purpose and rationale: To ensure an array of alternative approaches to the roadless resource issue, responsiveness to public comments on the roadless reevaluation "scoping" process, and to provide an alternative that designates for wilderness the roadless areas most supported for wilderness classification but without major conflicts with other resources.

b. Utilize a constraint that allows for an extension of the rotation age in the regenerated timber harvest associated with the wildlife prescriptions prescriptions. In combination with this constraint, restrict the acreage of harvest by decade to ensure that cutting units and harvest activities can be well distributed.

Purpose: To model the impacts a concern about elk habitat security will have on timber harvest and associated costs and to assure that the timber harvest schedule would be implementable given this alternative's wildlife emphasis.

Rationale: Maintenance of elk security requires increased flexibility in the timber harvest schedule, with extended rotations and increased dispersal of harvest.

c. Ensure that timber harvest in the first four decades focuses on the lodgepole pine stands that are highly suseptible to mountain pine beetle infestation by constraining 90% of the harvest to lodgepole pine stands.

Purpose: To salvage stands of lodgepole pine before mountain pine beetle related mortality reduces volume and value.

Rationale: Timber management of the old growth lodgepole pine stands on the Beaverhead NF requires immediate attention to the mountain pine beetle infestation, however the FORPLAN model tends to harvest the higher value mixed conifer (Douglas fir) stands before the lodgepole pine. A constraint forces a timber harvest schedule that more accurately reflects the management needed but has a negative impact on present net value.

d. Assign the West Pioneers to the mix of nonwilderness management prescriptions specified in the 1982 Land and Resource Management Plan.

Purpose and Rationale: The Montana Wilderness Study Area (MWSA) DEIS for the Taylor-Hilgard, Mt. Henry, and West Pioneer areas recommended nonwilderness management for the West Pioneers. This recommendation was reflected in the proposed land uses of the draft 1982 Land and Resource Management Plan for the Beaverhead NF which has been reviewed by the public. This nonwilderness management direction for the West Pioneers roadless area is carried through all alternatives except Alternative H in this analysis because it represents a site specific analysis of the roadless attributes and wilderness characteristics of the area (conducted in the MWSA process) that does not need to be repeated here. This would be the management for the area if Congress releases the area from wilderness consideration.

10. **Alternative I**

The goal of this alternative is to maximize present net value while also recommending all the roadless areas on the Beaverhead NF for wilderness classification. Few constraints are imposed on nonwilderness management for the forest to maximize opportunities to manage in a cost efficient manner. This alternative was developed as the maximize wilderness benchmark and because it was implementable, it was brought forward in the analysis as an alternative.

The criteria and assumptions underlying the development of this alternative are:

a. Allow timber harvest and livestock forage utilization on all suitable areas where it is cost efficient to do so.

b. Use cost efficiency as the primary guide in the determination of prescription assignment and scheduling.

c. Recommend wilderness classification for 100% of the roadless areas on the Beaverhead NF.

d. Manage the West Pioneers under the nonwilderness management reommendation of the Montana Wilderness Study DEIS, with the management prescriptions of the 1982 Land and Resource Management Plan.

The constraints used to meet the criteria and assumptions are:

a. Assign 100% of the roadless areas to wilderness prescriptions.

Purpose and rationale: To ensure an array of alternative approaches to the roadless resource issue and to maintain as many options as possible in this alternative for cost efficiency.

b. Provide a full array of prescriptions for each analysis area to ensure opportunities to maximize present net value.

Purpose and rationale: With an appropriately full array of management prescriptions, the Forplan model will assign prescriptions and schedule activities in a cost efficient manner.

c. Assign the West Pioneers to the mix of nonwilderness management prescriptions specified in the 1982 Land and Resource Management Plan.

Purpose and Rationale: The Montana Wilderness Study Area (MWSA) DEIS for the Taylor-Hilgard, Mt. Henry, and West Pioneer areas recommended nonwilderness management for the West Pioneers. This recommendation was reflected in the proposed land uses of the draft 1982 Land and Resource Management Plan for the Beaverhead NF which has been reviewed by the public. This nonwilderness management direction for the West Pioneers roadless area is carried through all alternatives except Alternative H in this analysis because it represents a site specific analysis of the roadless attributes and wilderness characteristics of the area (conducted in the MWSA process) that does not need to be repeated here. This would be the management for the area if Congress releases the area from wilderness consideration.

11. Alternative W

The goal of this alternative is to maximize present net value while emphasizing wildlife habitat protection and enhancement and recommending wilderness classification for roadless areas that have received substantial support for designation from environmental groups. This alternative also provides for timber harvest and livestock forage utilization where suitable.

The criteria and assumptions underlying the development of this alternative are:

a. Wildlife and fisheries habitat improvement activities will be emphasized.

b. Competition between livestock and elk for forage on winter ranges will be minimized.

c. Timber harvest and livestock forage use will be allowed on suitable lands, with potential conflicts with wildlife reduced through investment in habitat improvement.

d. Recommend that portion of the roadless resource that has . received support for designation from the environmental groups for wilderness classification.

e. Manage the West Pioneers under the nonwilderness management reommendation of the Montana Wilderness Study DEIS, with the management prescriptions of the 1982 Land and Resource Management Plan.

The constraints used to meet the criteria and assumptions are:

a. Assign 25 percent of the roadless areas to wilderness prescriptions. Designate for wilderness those areas identified by the Montana Wilderness Association as "Alternative W".

Purpose and rationale: To ensure an array of alternative approaches to the roadless resource issue.

b. Utilize a constraint that allows for an extension of the rotation age in the regenerated timber harvest associated with the wildlife prescriptions prescriptions prescriptions so that hiding cover can be provided for elk. In combination with this constraint, restrict the acreage of harvest by decade to ensure that cutting units and harvest activities can be distributed in a manner that protects hiding cover.

Purpose: To adequately model the impacts a concern about elk habitat security will have on timber harvest and associated costs and to assure that the timber harvest schedule would be implementable given this alternative's wildlife emphasis.

Rationale: Maintenance of elk security requires increased flexibility in the timber harvest schedule, with extended rotations and increased dispersal of harvest.

c. Require assignment of wildlife prescriptions in areas determined by spacial fitting to be high priority wildlife areas.

Purpose: To adequately model the costs and benefits of enhancing and protecting wildlife habitat on the Beaverhead NF. Also, to recognize the specific wildlife values of areas identified by line officers in the spacial fitting of alternatives.

Rationale: Protection of wildlife values in some areas requires use of wildlife prescriptions which incorporate management practices designed to enhance and protect wildlife habitat.

d. Assign the West Pioneers to the mix of nonwilderness management prescriptions specified in the 1982 Land and Resource Management Plan.

Purpose and Rationale: The Montana Wilderness Study Area (MWSA) DEIS for the Taylor-Hilgard, Mt. Henry, and West Pioneer areas recommended nonwilderness management for the West Pioneers. This recommendation was reflected in the proposed land uses of the draft 1982 Land and Resource Management Plan for the Beaverhead NF which has been reviewed by the public. This nonwilderness management direction for the West Pioneers roadless area is carried through all alternatives except Alternative H in this analysis because it represents a site specific analysis of the roadless attributes and wilderness characteristics of the area (conducted in the MWSA process) that does not need to be repeated here. This would be the management for the area if Congress releases the area from wilderness consideration.

12. Alternative S

This alternative was built from Alternative H, incorporating the comments of the public received during review of the Revised Draft EIS. Like alternative H, the goal of this alternative is to maximize present net value while responding to the variety of resouce use demands and concerns of the publics who utilize the Beaverhead NF lands and resources. This alternative meets demands for dispersed and developed recreation, while responding to concerns about wilderness designation in some of the more popular roadless areas. This alternative distributes timber harvest across all the classes of land and species within the suitable timber base and lodgepole harvest is concentrated in stands highly suseptible to mountain pine beetle infestations. Elk habitat security is maintained throughout the forest. The West Pioneers Wilderness Study Area is assigned a custodial management prescription.

The criteria and assumptions underlying the development of this alternative are:

a. Ensure maintenance of elk habitat security while allowing timber harvest and livestock grazing in areas where that resource use can be managed to be compatible with elk habitat management requirements.

b. Meet public demands for dispersed recreation in non-wilderness settings.

c. Recommend wilderness classification for roadless areas that have received substantial support for designation and where conflicts with other uses, such as off road vehicles and mineral and oil and gas exploration and development are acceptable. Also, recommend acres such that they dovetail with the wilderness recommendations for contiquous roadless areas.

d. Maintain the West Pioneers Wilderness Study Area in custodial status, protecting the wilderness characteristics of the area pending a decision by Congress on the nonwilderness/wilderness status of the area.

e. Recognize the timber harvest activities that have occurred on the Madison District in response to the mountain pine beetle infestation.

The constraints used to meet the criteria and assumptions are:

a. Assign 14 percent of the roadless areas to wilderness prescriptions.

Purpose and rationale: To ensure an array of alternative approaches to the roadless resource issue, responsiveness to public comments on the roadless reevaluation "scoping" process, and to provide an alternative that designates for wilderness, the roadless areas most supported for wilderness classification but without major conflicts with other resources.

b. Utilize a constraint that allows for an extension of the rotation age in the regenerated timber harvest associated with the wildlife prescriptions. In combination with this constraint, restrict the acreage of harvest by decade to ensure that cutting units and harvest activities can be well distributed.

Purpose: To model the impacts a concern about elk habitat security will have on timber harvest and associated costs and to assure that the timber harvest schedule would be implementable given this alternative's wildlife emphasis.

Rationale: Maintenance of elk security requires increased flexibility in the timber harvest schedule, with extended rotations and increased dispersal of harvest.

c. Use a constraint that limits regeneration harvest of mature sawtimber to ten percent of the existing acreage of mature sawtimber in any given decade, applied both to lodgepole working groups and mixed conifer working groups.

Purpose: Primary purpose of this constraint is to provide scheduling flexibility so that big game habitat security constraints affecting the scheduling of timber harvest over time can be met. Regenerated stands need to provide hiding cover before additional harvest can be scheduled lengthening out the time it takes to convert existing stands on the Forest. In addition this constraint ensures that timber harvest occurs in the in the lower value lodgepole stands as well as in the higher value mixed conifer stands in the early decades to provide an opportunity to manage stands that are highly suseptible to mountain pine beetle infestation.

Rationale: The significance of the big game resource on the Beaverhead was reemphasized through the public comments on the Revised Draft. The Cooperative Elk Logging Study guidelines indicate that with constraints on scheduling and design, timber harvest activities can be made compatible with big game habitat management objectives. In addition, timber management of the old growth lodgepole pine stands on the Beaverhead NF requires immediate attention, however the FORPLAN model tends to harvest the higher value mixed conifer (Douglas fir) stands before the lodgepole pine. A constraint forces a timber harvest schedule that more accurately reflects the management needed but has a negative impact on present net value.

d. Assign the West Pioneers to the custodial management prescription.

Purpose and rationale: The Congress must decide the wilderness/nonwilderness status of the West Pioneers Wilderness Study Area. Until that decision is made, the wilderness characteristics of the area must be maintained. If the area is classified wilderness (in spite of the Wilderness Study DEIS recommendation for nonwilderness) the custodial management prescription adequately serves as a model of wilderness management for the area.

e. Constrain the schedule to ensure that at least 5 percent of the area within the suitable timber base which requires cable harvest system is scheduled for management in the first decade and that at least 10 percent is scheduled in every succeeding decade.

Purpose and rationale: The economic analysis indicates that PNV can be optimized by delaying management of these lands until late in the planning horizon, when values have increased and the discount rate minimizes costs of management. Rather, management needs to be scheduled across all the types of lands within the suitable timber base, to even the harvest program out over time and to distribute the impacts of management so that mitigation can be effective.

13. Alternative SA

This alternative was built from Alternative HA, incorporating the comments of the public received during review of the Revised Draft EIS. Like alternative HA, the goal of this alternative is to maximize present net value while responding to the variety of resouce use demands and concerns of the publics who utilize the Beaverhead NF lands and resources. This alternative meets demands for dispersed and developed recreation, while responding to concerns about wilderness designation in some of the more popular roadless areas. This alternative distribute timber harvest across all the classes of land and species within the suitable timber base, but in lodgepole harvest is concentrated in stands highly suseptible to mountain pine beetle infestations. Elk habitat security is maintained throughout the forest. The West Pioneers Wilderness Study Area is assigned nonwilderness management prescriptions, including designation of a large roadless recreation management area (MA #8) that encompasses the majority of the study area. Some timber harvest (less than 1 MMBF per year) would be scheduled on the exterior boundaries of the area.

The criteria and assumptions underlying the development of this alternative are:

a. Ensure maintenance of elk habitat security while allowing timber harvest and livestock grazing.

b. Meet public demands for dispersed recreation in non-wilderness settings.

c. Recommend wilderness classification for roadless areas that have received substantial support for designation and where conflicts with other uses, such as off road vehicles and mineral and oil and gas exploration and development are acceptable.

d. Manage the West Pioneers under the nonwilderness management reommendation of the Montana Wilderness Study DEIS.

The constraints used to meet the criteria and assumptions are:

a. Assign 14 percent of the roadless areas to wilderness prescriptions.

Purpose and rationale: To ensure an array of alternative approaches to the roadless resource issue, responsiveness to public comments on the roadless reevaluation "scoping" process, and to provide an alternative that designates for wilderness the roadless areas most supported for wilderness classification but without major conflicts with other resources.

b. Utilize a constraint that allows for an extension of the rotation age in the regenerated timber harvest associated with the wildlife prescriptions. In combination with this constraint, restrict the acreage of harvest by decade to ensure that cutting units and harvest activities can be well distributed.

Purpose: To model the impacts a concern about elk habitat security will have on timber harvest and associated costs and to assure that the timber harvest schedule would be implementable given this alternative's wildlife emphasis.

Rationale: Maintenance of elk security requires increased flexibility in the timber harvest schedule, with extended rotations and increased dispersal of harvest.

c. Use a constraint that limits regeneration harvest of mature sawtimber to ten percent of the existing acreage of mature sawtimber in any given decade, applied both to lodgepole working groups and mixed conifer working groups.

Purpose: Primary purpose of this constraint is to provide scheduling flexibility so that big game habitat security constraints affecting the scheduling of timber harvest over time can be met. Regenerated stands need to provide hiding cover before additional harvest can be scheduled lengthening out the time it takes to convert existing stands on the Forest. In addition this constraint ensures that timber harvest occurs in the in the lower value lodgepole stands as well as in the higher value mixed conifer stands in the early decades to provide an opportunity to manage stands that are highly suseptible to mountain pine beetle infestation.

Rationale: The significance of the big game resource on the Beaverhead was reemphasized through the public comments on the Revised Draft. The Cooperative Elk Logging Study guidelines indicate that with constraints on scheduling and design, timber harvest activities can be made compatible with big game habitat management objectives. In addition, timber management of the old growth lodgepole pine stands on the Beaverhead NF requires immediate attention, however the FORPLAN model tends to harvest the higher value mixed conifer (Douglas fir) stands before the lodgepole pine. A constraint forces a timber harvest schedule that more accurately reflects the management needed but has a negative impact on present net value.

d. Assign the West Pioneers to a mix of nonwilderness management
prescriptions, including a large block of roadless recreation management.

Purpose and Rationale: The Montana Wilderness Study Area (MWSA) DEIS for the Taylor-Hilgard, Mt. Henry, and West Pioneer areas recommended nonwilderness management for the West Pioneers. This recommendation was reflected in the proposed land uses of the draft 1982 Land and Resource Management Plan for the Beaverhead NF which has been reviewed by the public. This nonwilderness management direction for the West Pioneers roadless area was carried through all alternatives except Alternative H in this analysis because it represented a site specific analysis of the roadless attributes and wilderness characteristics of the area (conducted in the MWSA process) that does not need to be repeated here. Following public review of the Revised Draft and based on a review of the management options for the area, the acreages within the mix of proposed land uses of the draft 1982 Land and Resource Management Plan have been revised. This would be the management for the area if Congress releases the area from wilderness consideration and if this Proposed Action was implemented.

e. Constrain the schedule to ensure that at least 5 percent of the area within the suitable timber base which requires cable harvest system is scheduled for management in the first decade and that at least 10 percent is scheduled in every succeeding decade.

Purpose and rationale: The economic analysis indicates that PNV can be optimized by delaying management of these lands until late in the planning horizon, when values have increased and the discount rate minimizes costs of management. Rather, management needs to be scheduled across all the types of lands within the suitable timber base, to even the harvest program out over time and to distribute the impacts of management so that mitigation can be effective.

Table **B-16** displays some of the priced costs and benefits associated with the alternatives, showing how the different constraints impact resource management costs and the resource benefits derived from those investments.

Alternative development is discussed further in the Forest Planning records.

Table B-16

Present Value Benefits and Costs (MM$)
Alternatives

Alternatives	Present Net Value at 4%	Benefits Discounted at 4% Timber	Benefits Discounted at 4% Recreation/ Wildlife	Benefits Discounted at 4% Range	Benefits Discounted at 4% Other	Costs Discounted at 4% Timber	Costs Discounted at 4% Roads	Costs Discounted at 4% Developed Recreation	Costs Discounted at 4% Range	Costs Discounted at 4% Other*
A	196	181	106	42	0	23	23	7	8	72
B	244	253	106	42	0	36	27	7	8	80
C	170	196	106	42	0	31	23	7	8	105
D	136	106	106	40	0	13	14	7	8	75
F	200	200	106	42	0	25	26	7	8	83
G	249	249	106	41	0	30	23	7	8	79
H	157	140	106	42	0	22	17	7	8	78
DEPT	172	163	106	43	0	28	19	7	8	79
HA	168	159	106	42	0	26	20	7	8	79
I	180	154	106	39	0	17	15	7	8	74
W	207	208	106	42	0	25	26	7	8	83
S	140	119	106	41	0	19	15	7	8	79
SA	143	125	106	41	0	20	16	7	8	79
Max PNV	298	309	106	41	0	36	31	7	8	76
Min Level	9	0	68	13	0	0	0	7	2	63

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*Includes recreation and wildlife costs that can not be separated from other costs. In addition, the other costs contain co General Administration and other non-separable costs that could not be assigned to individual resources. This makes the dir comparisons of individual resources misleading.

VIII. Summary of Effects of Constraints, Selected Benchmarks, and Alternatives

A. Overview

The purpose of estimating and displaying these effects is to compare present net value, social and economic impacts, outputs of goods and services, and overall protection and enhancement of environmental resources. This comparative analysis is the basis for evaluating alternatives and selecting a proposed action, which are planning steps 7 and 8. This section focuses on the understanding of economic effects and tradeoffs derived from the analysis of alternatives and benchmarks. The constraints are discussed in detail in Appendix B, Section VII, and social and environmental effects are discussed in Chapters II and IV.

B. Process for Evaluating Significant Constraints

Management objectives of benchmarks and alternatives were achieved by constraining FORPLAN as described in Section VII. The efficiency tradeoffs of individual objectives can be determined by comparing the PNV of a FORPLAN solution which meets the objective and one which does not. The change in PNV is the efficiency tradeoff of achieving a specific objective if both solutions have cost efficient prescriptions, both solutions maximize PNV, and the constraints are cost-efficient. The efficiency tradeoff was not determined for individual alternative objectives because of the prohibitive costs of analyzing every constraint used to develop alternatives. But by comparing alternatives, the economic tradeoffs of the groups of objectives which have the most significant impact on PNV can be determined. These efficiency tradeoffs can then be compared to environmental and social consequences to help decision makers identify the alternative which maximizes net public benefits.

A major factor in the economic tradeoff analysis is the order in which the objectives are analyzed. For example, the economic tradeoff of meeting management objectives A and B can be determined by comparing FORPLAN solutions with various combinations of the two objectives. The change in PNV due to meeting only A may be $5 MM, and the change due to meeting only B may be $11 MM. However, the change due to meeting both A and B will probably be less than $16 MM. In addition, the cost of meeting objective A in one alternative will not necessarily be the same as meeting the same objective in another alternative. Therefore, the economic tradeoffs discussed in this section are only relevant to the actual alternative where the objectives were analyzed.

C. Tradeoffs Among Alternatives

The discussion in this part focuses on economic tradeoffs. Resource outputs and socioeconomic effects are displayed in Chapter II, and environmental effects are discussed in Chapters II and IV.

1. Response to Issues

Alternatives were designed to address the seven public issues. Each alternative is responsive to each issue in a different way and to a distinct degree. No alternative can fully resolve all issues because of the conflicts among issues. Table **B-15** compares the response of each alternative to the major issues in terms of quantifiable non-priced benefit indicators; however, these indicators cannot be assumed to be fully indicative of the responsiveness of the alternative to the issue. More discussion of the alternatives' responses to issues is incorporated in the DEIS in Chapters II and IV. A detailed discussion of issues is presented in Appendix A.

2. Economic Tradeoffs

This discussion identifies the economic consequences of implementing the alternatives by comparing each alternative to the maximum present net value benchmark and the minimum level benchmark and to at least three other alternatives: the next cheapest alternative in terms of discounted costs, the next cheapest alternative in terms of PNV, and Alternative A (Current Level Management). In some cases, alternatives with similar objectives are also compared. The comparisons between all these analyses form the analysis base for balancing economic tradeoffs with nonpriced resource outputs.

One measure of the cost of an alternative is the discounted cost which represents the equivalent payment required by the government to implement an alternative. The minimum cost for federal ownership is defined by the minimum level benchmark as $72 million. Table **B-17** displays the discounted costs, discounted benefits, and PNV in order of increasing costs. In general, the costs of alternatives increase with the size of the timber and road construction programs. These costs range from $117 million for Alternative D with the lowest timber program to $133 million for Alternative A (Current Level Management) to $174 million for Alternative C, the alternative which attempts to maximize commodity production while at the same time designating a substantial portion of the roadless acres as wilderness.

By comparing the benefits and costs of an alternative with the next cheapest alternative, the economic consequences of the additional expenditure can be compared to the additional nonpriced benefit values (often subjectively measured).

The sensitivity analysis conducted to determine the sesitivity of the solution to changes in assumptions about timber values and timber price increases included an assessment of the Proposed Action (Alternative S). The PNV of Alternative S is $143 million using the values and price increases that are comprable to the other alternatives. The PNV of Alternative S is $53 million using the different set of assumptions (see Section IV-B-3-a). Discounted costs comprable to other alternatives are $128 million and discounted benefits are $267; with the different assumptions discounted costs are $123 million and discounted benefits are $176 million. Costs decrease slightly in the analysis because less acres can be managed with the lower assumptions about values. This analysis is discussed further in Chapter II and in the presentation below, of the economic tradeoffs for each alternative.

Table B-17

Discounted Costs, Benefits, and Present Net Value by Alternative

Alternative	Costs Discounted $MM (4%)	Benefits Discounted $MM (4%)	Present Net Value $MM (4%)
D	117	253	136
I	120	300	180
S	128	267	140
SA	130	273	143
H	132	289	157
A	133	329	196
H(A)	139	307	168
Dept	141	313	172
G	146	396	249
F	148	348	200
W	149	357	207
B	158	401	244
C	174	344	170
Max PNV	158	456	298
Min Level	72	81	9

Another measure of the cost of an alternative is the change in PNV between alternatives. The maximum present net value of the Forest is defined by the maximum PNV benchmark as $298 million. The difference between $298 million and the PNV of an alternative represents the foregone investment opportunity (opportunity cost) to the government for implementing that alternative. Table B-18 displays the discounted costs and benefits by resource and the PNV in order of decreasing PNV. In general, the PNV of alternatives increases with the size of the timber program but decreases as constraints are imposed designed to protect other resources. For example, changes in PNV can be caused by constraints which preclude regulated timber harvest from a tentatively suitable area because of other resouce values, disperse timber harvest over the landscape decreasing the amount of timber harvest opportunities, and regulate the harvest schedule to ensure maintenance of hiding cover for elk. By comparing each alternative with the alternative having the next highest PNV, the incremental economic tradeoffs can be compared to the incremental nonpriced benefits.

Table B-18

Present Net Value, Discounted Costs, and Discounted Benefits by Alternative

Alternative	Present Net Value $MM (4%)	Costs Discounted $MM (4%)	Benefits Discounted $MM (4%)
G	249	146	396
B	244	158	401
W	207	149	357
F	200	148	348
A	196	133	329
I	180	120	300
Dept	172	141	313
C	170	174	344
H(A)	168	139	307
H	157	132	289
S(A)	143	130	273
S	140	267	128
D	136	117	253

Max PNV	298	158	456
Min Level	9	72	81

The economic consequences of changing from the current land uses, output schedule, and budget are defined by comparing the PNV of the alternatives with the PNV of Alternative A (Current Level Management) and the Current Direction benchmark. Alternatives G, B, W, and F allow for a more economically efficient assignment of prescriptions and priced resource output schedule than the Current Level of Management. These alternatives have more economically efficient timber management programs and larger suitable timber land bases than the Current Level of Management and the other alternatives. However, associated with the potential to increase efficiency are substantially higher costs--higher levels of road maintenance, fire protection, general administration, timber sale preparation, and timber sale administration. The lower PNV's of Alternatives H, H(A), S, S(A), I, C, and D result from the efforts made to resolve issues and concerns by providing net public benefits that do not have priced values to contribute to PNV (such as elk habitat security, old growth, and water quality).

The next section describes the economic consequences of implementing each alternative. The discussion of economic efficiency only considers the monetary value of the Forest as measured by PNV. In Chapter II, the efficiency discussion also considered nonpriced Forest values as they contribute to net public benefits.

a. Alternative A

Alternative A (Current Level of Management) provides moderate levels of market outputs and the potential for moderate levels of nonmarket outputs with the expenditure levels that have been experienced in a recent three year period (1980-82). These experienced budget levels lower nonmarket resource management levels, with costs constrained primarily in general administration, recreation and range management. The expenditure constraint is unique to Alternative A.

Approximately 1,050,000 acres would be managed at the custodial level in Alternative A, current management constrained by experienced budgets. This is compared to only 210,000 acres of custodial management if current management were as specified in the 1978 Land Management Plan, unconstrained by budget. The acres which are forced into custodial management are those formerly assigned wildlife, recreation, and range prescriptions; the resource outputs are still produced but at lower levels with less investment. The cost decreases will not reduce recreation use. Nor are range or timber production levels reduced. Rather, timber and range production are concentrated on the most economical sites, with less cost efficient areas moving into the custodial level of management.

The discounted costs of implementing Alternative A are the sixth lowest of the alternatives. The benefit/cost ratio is fourth highest, reflecting the cost efficiency impact of the budget constraint which forces a reduction in emphasis on nonpriced benefits while retaining the timber and range programs in the most cost efficient areas. The expenditure constraint does not suppress the discounted benefits that can be produced but the shifts in land use to custodial management do result in some reduction in benefits from the level they would be at if current management as described in the 1978 Land Management Plan could be fully implemented. The discounted costs of Alternative A are 4 percent less than the Current Direction benchmark; the discounted benefits are 3 percent less; the PNV is 2 percent less.

The opportunity cost associated with implementing Alternative A rather than the maximum PNV benchmark is $102 million, while the opportunity cost of the Current Direction benchmark is $98 million. The discounted costs of Alternative A are $25 million less than the maximum PNV benchmark while the discounted benefits are $127 million less. Alternative A is less costly in terms of general administration and recreation and range management because the expenditure constraint reduces these costs below the standards in the management prescriptions. Timber management and road construction costs are lower because the timber program is smaller. Thirty eight percent less volume is harvested and 29 percent fewer roads are needed for management due to a suitable timber land base that is 27 percent smaller. The discounted timber benefit is 41 percent less in Alternative A than in the maximum PNV benchmark.

In Alternative A the suitable timber land is 535,000 acres, with the average net discounted value of the timber resource (discounted timber benefits minus discounted timber and road costs) approximately $252 per acre of timberland. This can be compared to the maximum PNV benchmark, with an average net discounted value of the timber resource of about $331 per acre of timberland.

The benefit/cost ratio associated with Alternative A is 2.47; maintained at that moderate level, even with the budget constraint, by reducing the management activities and funding for non-priced resources. The benefit/cost ratio for Alternative A is slightly higher than it is for the Current Direction benchmark, indicating that a budget constraint and the flexibility in scheduling and land use necessary to respond to that budget constraint resulted in more cost-efficient management than straight forward implementation of the 1978 Land Management Plan.

The domestic livestock grazing program of Alternative A is 190,000 AUM's per year in decade 1. Most of the increase in potential AUM's over time is associated with transitory forage created through timber harvest. The cost of the range program is about $319,000 per year, or $1.68 per AUM in decade 1.

Alternatives I,D, H, S and SA are less costly to implement in terms of discounted costs. However, the additional dollars in timber management costs required to implement Alternative A are more than offset by the additional discounted timber benefits. Alternatives H, HA, the Departure, S, and SA have higher timber management costs per volume harvested but less dollars benefits than Alternative A. This is because these alternatives focus the timber harvest program on lodgepole pine, while Alternative A incorporates more of other higher valued species into the program. In addition, these alternatives have improved other non-priced values. Alternative A has proposed land uses and output schedule that has fewer constraints which preclude timber harvest in suitable timberlands, and which disperse harvest activities over the Forest than Alternatives H, HA, the Departure, S and SA.

b. Alternative B

Alternative B provides high levels of market resources with limited consideration for nonmarket outputs. Alternative B is responsive to the RPA Program objectives for both range and timber. This alternative does not recommend any additional wilderness classification for the Beaverhead Forest. Alternative B has the highest long term sustained yield of timber, the highest discounted timber costs, the highest discounted timber benefits, and the second highest PNV of all the alternatives considered.

The discounted costs associated with Alternative B are high because of the large timber and road construction program. Present value costs for Alternative B are the same as for the maximum PNV benchmark. Only discounted road costs are slightly lower and discounted "other" costs are slightly higher. Thus, Alternative B provides a very cost efficient program for management.

The benefits associated with Alternative B are the highest of the alternatives again because of the large timber and road construction program. The discounted benefits are $55 million less than the maximum PNV benchmark, or 12 percent less. The difference in benefits is due to the RPA constraints imposed on the timber program. These limit flexibility in cost efficient scheduling of the timber harvest program. The benefit/cost ratio for Alternative B is 2.55, the second highest of the alternatives considered.

The PNV of Alternative B is $244 million, the second highest PNV of the alternatives. The highest PNV is for Alternative G, which has lower discounted timber benefits but also has lower timber and road costs. Alternative G did not have any timber scheduling constraints imposed, increasing the flexibility in scheduling the timber harvest program over what it was in Alternative B. The third highest PNV is for Alternative W, and it is $37 million less than for Alternative B. The reduction in PNV is due to the scheduling constraints imposed on timber harvest to meet wildlife habitat objectives. The opportunity cost of implementing Alternative B rather than the maximum PNV benchmark is $54 million.

The total suitable timber base decreases from 730,600 to 652,500 acres between the maximum PNV benchmark and Alternative B, and the average discounted net value of the timber program per acre varies from $331 per acre to $291 per acre for Alternative B. Timber costs are less in decade 1, but more in decades 3 and 5 for Alternative B. Road costs are less than in the maximum PNV benchmark. The long term sustained yield of Alternative B is 16.4 MMCF compared to 17.3 MMCF for the maximum PNV benchmark. The reduction in potential volume and value is largely due to the constraints imposed for the first five decades to achieve RPA objectives, + or - ten percent.

The domestic livestock forage produced in Alternative B is decade 1 meets RPA objectives within 10 percent and would support 184,000 AUM's. This is a range program smaller than under Current Direction. Through decade 4, AUM potential is within 10 percent of RPA, however, by decade 5, RPA objectives can not be meet and AUM's provided would be 21 percent below the RPA objective. Range program costs and benefits are less than they would be under Current Direction but the relationship between AUM's provided and costs and benefits is the same. RPA objectives in decade 5 could be met if forage reserved wildlife utilization was available for domestic livestock. Alternatively, higher investments in range improvements or departure from nondeclining timber flow could increase forage production in decade 5.

Alternative A (Current Level of Management) has discounted costs that are 16 percent less than Alternative B, and discounted benefits that are 18 percent less resulting in a lower benefit/cost ratio and lower PNV. The suitable timber land base and the long term sustained yield are also lower. Alternative B has a more efficient land use and output schedule than Alternative A because of fewer constraints on the timber program: an additional 117,200 acres are available for timber management. Some of the potential increase in PNV is traded off to increase timber harvest in the first five decades to meet RPA objectives with associated increased levels of timber sale preparation and administration, road construction, and road maintenance. In the first decade, Alternative B will cost 10 percent more but return 6 percent less in terms of undiscounted costs and benefits. It is only over the long term that Alternative B produces more returns than costs. Implementing Alternative B instead of Alternative A will improve the PNV $48 million or 20 percent. The investments required in the first decades are more than offset by large returns over the planning horizon. The major tradeoffs associated with focusing management on timber production are a modified landscape, reduced elk security few roadless recreation areas, and lower soil and water quality.

c. Alternative C

Alternative C provides high levels of market resources while at the same time recommending a significant percentage (75 percent) of the inventoried roadless lands for wilderness classification. It has the same objectives as Alternative B except more area is designated wilderness. This alternative has the lowest benefit/cost ratio, and third highest discounted costs of all the alternatives considered.

Timber production is precluded from 34 percent of the tentatively suitable timberland to provide 933,700 acres of additional wilderness. Timber harvest is not restricted on the remaining suitable lands so that maximum cost-efficient production of timber can occur.

Alternative C is the most expensive alternative in terms of discounted costs because it has the second largest timber program and fourth largest road construction program of the alternatives occurring on one of the smallest suitable land bases with additionally the second largest wilderness acreage. Timber and road costs are slightly less than for Alternative B, the highest timber producing alternative, but "other" costs, including wilderness management costs, are substantially higher. The timber benefits received for the dollars invested are 23 percent lower than for Alternative B, and 37 percent lower than for the maximum PNV benchmark. Alternative C ranks fourth lowest in PNV of the alternatives. Efficiency could be improved by lowering the timber harvest, or wilderness objectives. Alternative H(A) and H are lower because of the lodgepole pine harvest and because these alternatives along with Alternative D havest less timber volume in total.

The opportunity cost of implementing Alternative C rather than the maximum PNV benchmark is $128 million. The discounted costs are 9 percent higher while the discounted benefits are 37 percent lower. The changes in benefits and costs are due to requiring the timber and range programs to meet RPA objectives for five decades on a comparatively limited land base. The suitable land base for Alternative C is 537,200 acres, compared to 652,500 acres for Alternative B and 730,600 acres for the maximum PNV benchmark. The suitable land base for

Alternative C is about 66 percent of the tentatively suitable timberland. The long term sustained yields are 14.1 MMCF for Alternative C, 16.4 MMCF for Alternative B, and 17.3 MMCF for the maximum PNV benchmark. With 26 percent fewer suitable acres than the maximum PNV benchmark, Alternative C produces 18 percent less timber with 14 percent less costs and 37 percent fewer dollar benefits. With 18 percent fewer suitable acres than Alternative B, Alternative C produces 14 percent less timber with 14 percent less costs and 23 percent fewer dollar benefits. Both Alternatives B and C have reduced benefits from the maximum PNV benchmark because of the RPA constraints imposed on the timber harvest program.

The timber costs in decade 1 are 14 percent lower for Alternative C than for Alternative B, but the returns to the Federal Treasury for timber are 40 percent lower. Over time the ratio between costs and benefits associated with the timber program for Alternative C improve, however, the constrained suitable land base limits opportunities to achieve higher economic returns from timber harvest. In addition, the RPA constraints limit options for scheduling timber harvest. RPA objectives are achieved for the first four decades but by decade 5, the base sale schedule falls below the RPA objective.

Alternative B is the next most costly alternative in terms of discounted costs. The reduction in discounted costs from Alternative C to B has to do with the larger suitable land base and fewer wilderness acres. Alternative C has a lower PNV than Alternative A (Current Level of Management). The PNV is 13 percent lower, but both discounted costs and benefits are higher. Benefits are 4.5 percent higher; costs are 23.6 percent higher.

Alternative HA is close to Alternative C in terms of PNV. Alternative C has a lower opportunity cost resulting from it's land use and timber harvest schedule than Alternative HA because of fewer constraints on the timber program and the scheduling of higher value stands for harvest. Alternatives H and HA focus the timber program on lodgepole pine. Alternative C considers an additional 158,700 acres suitable for timber production when compared to Alternative H (an additional 103,500 acres if compared to Alternative HA) in spite of the substantial wilderness acreage recommended in Alternative C for classification. However the gains in efficiency and in suitable land over that in Alternatives H and HA are more than offset by decreased other resource values such as roadless recreation opportunites, soil and water quality within the suitable land base, decreased elk security in some areas, and high first decade timber production costs.

d. Alternative D

Alternative D emphasizes recreation opportunities and the protection and maintenance of elk habitat. This alternative focuses on the amenity resources, such as recreation and wildlife, by restricting timber harvest to areas that have already been developed and by recommending about 62 percent of the inventoried roadless areas on the Beaverhead Forest for wilderness classification. This alternative has the lowest PNV of all the alternatives primarily because of the low timber harvest program. Timber benefits are lower than in other alternatives but other resource benefits remain as high as in the other alternatives considered. The benefit/cost ratio of this alternative is low but not as low as for Alternative C.

Alternative D is the most inexpensive alternative to implement in terms of discounted costs because the entire timber harvest program is concentrated in that portion of the Beaverhead that has already been roaded and developed. Thus, road costs are the lowest of all the alternatives; both purchaser credit costs and capitial investment needs. Concentration of activity in the roaded areas reduces the timber harvest program, resulting in the lowest discounted timber costs for an alternative. Alternative D is conversely the most expensive alternative to implement in terms of PNV because foregone timber values more than offset the savings in timber and road costs. Foregone timber values are due to reductions in the suitable timber base resulting from wilderness recommendations and elk habitat security constraints imposed on the timber harvest schedule over time and space. The discounted benefits are the lowest of the alternatives by a greater margin than the discounted costs are; resulting in the smallest PNV.

The opportunity cost of implementing Alternative D rather than the maximum PNV benchmark is $164 million. Alternative D is $41 million less expensive in terms of discounted costs; but $203 million less productive in terms of benefits. The timber and road programs are the primary cause of the differences. The long term sustained yield of Alternative D is 6.0 MMCF while the long term sustained yield of the maximum PNV benchmark is 17.3 MMCF. The suitable timber land base of Alternative D is 313,100 acres or 57 percent smaller than the maximum PNV benchmark suitable land base. The discounted cost per acre of timber management in Alternative D is $41.50 compared to a cost per acre in the maximum PNV benchmark of $49.30. Cost differences are due to the fact that the suitable land base of Alternative D is already largely accessed. Alternative D would have some higher costs, however, because the sale program is designed to maintain the effectiveness of elk hiding and thermal cover. In addition, future timber harvest is constrained by the size and degree of development of the suitable land base. Most of the opportunity cost is due to foregone timber values.

Alternative I is the next most inexpensive alternative in terms of discounted costs. However, Alternative I is not the next most costly in PNV forgone; Alternative S is. Alternative I has a relatively small suitable timber base (347,100 acres--only 34,000 acres larger than Alternative D and larger than Alternative S by 9,000 acres) because 100 percent of the lands in the roadless inventory are recommended for wilderness classification. Discounted timber costs are 24 percent higher than for Alternative D; the long term sustained yield however is 28 percent higher. The PNV of Alternative I is 24 percent higher than for Alternative D. The benefit/cost ratio improves from 2.17 for Alternative D to 2.50 for Alternative I.

Alternative S has the next lowest PNV. The opportunity cost of Alternative S is $158 million compared to $164 million for Alternative D. Many of the costs that are associated with Alternative D are incorporated into Alternative S (also Alternative H); notably scheduling and distribution constraints imposed on the timber harvest program, and a small (378,500 acres) suitable timber base. However, in Alternative H an emphasis on increasing the lodgepole component of the base sale schedule is added and in ALternative S an effort is made to refine the scheudling constraints further to ensure opportunities are available for regeneration of hiding cover prior to additional harvest in areas of key wildlife habitat.

Alternative D has a smaller suitable timber land base than Alternative A (Current Level Management)--about 42 percent smaller-- and a lower long term sustained yield--44 percent lower. This results in a lower PNV (31 percent lower). The difference between the discounted costs is $16 million (Alternative D is 12 percent more inexpensive than Alternative A); the difference between discounted benefits is $76 million (Alternative D is 23 percent less productive than Alternative A.) The timber harvest program of Alternative D has a lower benefit/cost ratio than Alternative A due to the constraints incorporated to meet wildlife objectives. Discounted road construction costs are substantially lower in Alternative D than Alternative A. However, the "other" resource costs of management are slightly higher in Alternative D, reflecting the budget constraint of Alternative A which minimized investment in management of those resources that do not contribute to calculations of PNV.

e. Alternative F

Alternative F attempts to produce a moderate to high level of commodity resources while at the same time mitigating the impacts of development of the timber resource in particular by incorporating scheduling constraints and harvest distribution constraints. Approximately 36 percent of the inventoried roadless acres are recommended for wilderness classification. Wildlife management prescriptions are assigned to important wildlife areas. This alternative has the fourth highest PNV of all the alternatives; and also the fourth highest discounted benefits. Discounted costs are fourth highest. The benefit/cost ratio however is only the sixth best of the alternatives. Relatively high costs are involved in attaining the dollar benefits associated with this alternative but the higher production level for timber ensures a relatively high PNV.

The costs associated with Alternative F are moderate in the range of alternatives considered. These costs are 6 percent less than the discounted costs associated with the maximum PNV benchmark. Discounted timber costs are sixth or seventh highest of the alternatives but discounted road costs are second or third highest as are "other" costs. Higher road costs are a result of the additional mileage of road construction needed to access a timber harvest program widely distributed throughout the suitable land base because of constraints requiring spacial distribution to meet wildlife habitat concerns. "Other" costs include unseperable costs associated with special wildlife habitat management activities. The discounted benefits associated with Alternative F are also moderate in the range of alternatives considered. The primary difference between alternatives is in the timber program. The discounted benefits are 24 percent less than the discounted benefits of the maximum PNV benchmark.

The opportunity cost of Alternative F is $98 million. The benefit/cost ratio of Alternative F--2.35 can be compared to the benefit/cost ratio of the maximum PNV benchmark--2.89. The benefit/cost ratio of Alternative F could be improved with the removal of the constraints designed to protect wildlife habitat, or with an increase in the size of the suitable timber land base. Alternative F has a suitable timber base of 609,300 acres, third largest of the alternatives but still only 75 percent of the tentatively suitable land base and 121,300 acres or 17 percent less than the suitable timber base of the maximum PNV benchmark. With a larger land base, the benefit/cost ratio and hence PNV could be improved as more flexibility in scheduling the timber program would exist. This is apparent if Alternative F is compared to ALternative W. Alternative W has the same wildlife constraints as Alternative F, however, the suitable timber base is 6,500 acres larger. That relatively minor difference leads to discounted costs less than 1 percent higher in Alternative W, but discounted benefits that are 2.5 percent higher. The benefit/cost ratio improves from the 2.35 of Alternative F to 2.39 with Alternative W.

The long term sustained yield of Alternative F is 11.4 MMCF compared to the long term sustained yield of the maximum PNV benchmark of 17.3 MMCF.

Alternative F has less cost efficient land use and timber harvest schedule than Alternative A (Current Level Management) once a budget constraint has weeded out some of the less efficient land uses of the 1978 Land Management Plan. This is largely because of the wildlife constaints and their impact on timber and road costs and because of the "other" costs associated with the wildlife prescriptions of Alternative F. Still, the PNV of Alternative F is higher than the PNV of Alternative A, in large part simply because the long term sustained yield of the former is greater.

Alternative G is slightly less costly to implement if discounted costs are reviewed. Alternative G is only slightly constrained in achieving maximum cost efficiency in timber management. As discussed above, Alternative W is slightly more costly to implement but provides greater benefits due to greater flexibility involved in achieving wildlife objectives.

Managing for a moderate to high level of timber production while maintaining elk security areas and a distribution of harvest that permits maintenance of hiding cover is expensive in terms of direct costs and foregone investment opportunities.

f. Alternative G

Alternative G provides an opportunity to manage the Beaverhead Forest with the lowest opportunity costs of any alternative, with only small additional recommendations for wilderness classification. Cost efficiency is used as the primary guide in the determination of proposed land uses and production schedules. This alternative has the highest PNV of the alternatives considered, with the second highest level of discounted benefits and the fifth highest level of investment needed for management as defined by discounted costs. The benefit/cost ratio of Alternative G is 2.70--highest of the alternatives considered.

The costs associated with Alternative G are lower than several of the other alternatives for a variety of reasons. First, few constraints are imposed on resource management that increase the costs above a basic level. Second, production of resources is not pushed above that defined to be cost efficient, limiting the level of cost incurred. An example of the first situation is Alternative F, wherein discounted "other" costs are higher than Alternative G due to investments in wildlife management activities and discounted road costs are higher than in Alternative G due to the requirement that the timber program be well distributed even if more costly. An example of the second situation is Alternative B, wherein timber costs are higher than Alternative G due to a higher timber harvest program required to meet RPA objectives even if not maximally cost efficient.

The benefits associated with Alternative G are not as high as for Alternative B, where the requirement for a higher timber harvest program increases the timber benefits. But in Alternative B, those additional benefits do not compensate for the additional costs required to produce them, resulting in a PNV lower than that of Alternative G.

The opportunity cost of implementing Alternative G rather than the maximum PNV benchmark is $49 million. The discounted costs are $12 million less and discounted benefits are $60 million less. Alternative G has the lowest opportunity cost of all the alternatives, achieving a PNV that is 84 percent of the maximum PNV attainable on the Forest. The long term sustained yield of Alternative G is 13.3 MMCF, 4 MMCF or 77 percent of the long term sustained yield that would occur if maximum cost efficiency was achieved. The suitable timber base of Alternative G is 547,600 acres, 68 percent of the tentatively suitable timber land and 75 percent of the suitable timber base of the maximum PNV benchmark. The net discounted timber value is $54 million less or 20 percent less than the value in the maximum PNV benchmark. The domestic livestock forage program in decade 1 is 185,000 AUM's per year, slightly higher than for the maximum PNV benchmark. Range costs and benefits are approximately the same per AUM as for the other alternatives and for the maximum PNV benchmark.

Alternative G has a land use and resource production schedule that is more efficient than Alternative A (Current Level Management), as can be seen by the PNV that is 21 percent higher. Discounted costs are 9 percent more for implementation of Alternative G, however, the priced benefits derived are 17 percent higher. Alternative G used maximization of PNV to guide prescription selection and harvest schedules, while Alternative A used the 1978 Land Management Plan modified by a budget constraint. The discounted road costs of Alternatives A and G are very similiar, the discounted timber costs are higher for Alternative G by 23 percent, but the benefits associated with the timber program exceed Alternative A by 27 percent. Alternative G found it cost effective to schedule timber harvest on a suitable timber base that is only 2 percent larger than Alternative A (not necessarily the same acres); but produces a long term sustained yield of timber that exceeds Alternative A by 19 percent.

g. Alternative H

Alternative H responds to the variety of resource use demands and concerns of the publics who utilize the Beaverhead NF lands and resources. This alternative provides a high level of roadless recreation opportunities as well as recommendations for wilderness classification in some of the inventoried roadless areas receiving highest public support for classification. Wildlife concerns are also addressed through constraints on the spacial and temporal distribution of the timber program. In addition, timber harvest for the first four decades is concentrated in areas of lodgepole pine, highly suceptible to infestations of mountain pine beetle. Alternative H assigns the entire West Pioneer Wilderness Study Area to custodial management, pending a decision by Congress regarding wilderness classification. Because of the constraints imposed to achieve non-priced objectives, this alternative has the fourth lowest PNV.

The costs of implementing Alternative H are fifth lowest of the alternatives considered. The discounted benefits associated with this alternative are fourth lowest, indicating a higher cost for benefits produced than for several of the other alternatives. Consideration of costs and benefits should be done with the timber havest volume in mind; this alternative has the fifth lowest long term sustained yield capacity. The benefit/cost ratio for Alternative H is fifth lowest of the alternatives considered. Alternatives C, D, S, and SA have higher proportional investments for benefits received than Alternative H.

The opportunity cost of implementing Alternative H rather than the maximum PNV benchmark is $141 million. Precluding timber management from 53 percent of tentatively suitable timberland, dispersing timber harvest over the Forest, achieving other wildlife habitat maintenance objectives, and emphasizing lodgepole pine harvest in the early decades result in the net timber value of only 45 percent of the value in the maximum PNV benchmark. The timber costs are 39 percent less than in the maximum PNV benchmark; road costs are 45 percent less than in the maximum PNV benchmark; however, the timber benefits are 33 percent less.

Alternative H has a suitable timber base of 378,500 acres, 52 percent of the tentatively suitable timber base and the fifth smallest base of the alternatives. The suitable timber base of Alternative H is 48 percent of the base associated with the maximum PNV benchmark. The long term sustained yield of Alternative H is 10.4 MMCF, compared to 17.3 MMCF for the maximum PNV benchmark. The cost of timber harvest for Alternative H is higher than for the maximum PNV benchmark due to the constraints imposed to meet wildlife objectives; the smaller suitable land base reducing flexibility; and the emphasis on harvest of the lower value lodgepole pine timber in the early decades. The average discounted net timber value decreases from $374 acre of suitable timberland in the maximum PNV benchmark to $318 acre of suitable timber land in Alternative H.

Alternative HA has slightly higher discounted costs than Alternative H. Alternative HA is discussed in detail below; but briefly, the increased investment is associated with management activities scheduled for the West Pioneers. These investments in the timber and road construction programs result in higher discounted benefits and a PNV that is $11 million greater.

Alternative C has the next higher PNV from Alternative H (with the exception of Alternative HA), $13 million higher. Both the discounted costs and discounted benefits of Alternative C are substantially higher than Alternative H, and the benefit/cost ratio is lower indicating that higher production levels for priced resources result in a higher PNV but the cost of producing those outputs is also higher.

The economic consequences of implementing Alternative H instead of Alternative A (Current Level Management) are a reduction in PNV of $39 million (approximately 19 percent). Discounted costs are nearly the same ($1 million difference) but discounted benefits associated with Alternative H are 12 percent less than in Alternative A. The long term sustained yield is very similiar for the two alternatives however Alternative H would reduce the suitable timber base from 535,300 acres to 378,500 acres. Lower benefits are in large part due to the emphasis on lodgepole pine harvest. Road construction costs are lower but "other" resource costs are higher reflecting the emphasis of this alternative on wildlife and recreation.

Alternative H has a relatively low PNV because this alternative attempts to respond to the variety of resource management demands of the public for timber, wilderness and roadless recreation areas, elk security, diversity, water quality, and fish populations--not all of which contribute priced benefits to any calculations of PNV. The tradeoffs of providing nonmarket resources are reflected in the benefit/cost ratio as well as in PNV.

h. Alternative H (dept)

Alternative H (dept) is the same land allocation and has the same management objectives as Alternative H. However, Alternative H (dept) increases the first decades' timber harvest levels by departing from nondeclining flow in an effort to accelerate the harvest of lodgepole pine suseptible to mountain pine beetle infestation. In providing flexibility for the departure, the wildlife constraints on scheduling of timber harvest were removed. This alternative has the seventh highest PNV of the alternatives considered, 7.5 percent higher than Alternative H. The increased flexibility in timber scheduling allows for improvement in PNV over the nondeparture Alternative H. However, the increase in PNV is not as great as it could be if harvest increased in stands other than lodgepole pine.

The discounted costs associated with implementation of Alternative H (dept) are 7 percent higher than the discounted costs of implementing Alternative H. Thus, the discounted costs of Alternative H (dept) are eighth lowest of the alternatives considered. The discounted benefits associated with this alternative are 8 percent higher than the discounted benefits of implementing Alternative H. The benefit/cost ratio of Alternative H (dept) is higher than for Alternative H but is still seventh lowest of the alternatives considered. Only alternatives C,D, H, HA, S, and SA have higher investments for the dollar benefits received.

The opportunity cost of implementing Alternative H (dept) rather than the maximum PNV benchmark is $126 million. Precluding timber management from about 53 percent of the tentatively suitable timberland (from 48 percent of the economically suitable as described in the maximum PNV benchmark), and emphasizing lodgepole pine harvest in the early decades contribute significantly to the opportunity cost. Relaxation of the wildlife constraints forcing a distribution of timber harvest in time and space that were incorporated in Alternative H does not appreciably increase PNV or reduce opportunity cost for the departure over what it is for Alternative H.

The discounted timber costs of Alternative H (dept) are $6 million (27 percent) higher than for Alternative H, but 22 percent lower than the discounted timber costs of the maximum PNV benchmark. The discounted timber benefits of Alternative H (dept) are $163 million, $23 million (16 percent) higher than for Alternative H, but only 53 percent of the discounted timber benefits of the maximum PNV benchmark.

The long term sustained yield of the departure alternative is 13.4 MMCF (40.2 MMBF) compared to 10.4 MMCF (33.3 MMBF) for Alternative H. Thus, allowing harvest of additional stands early in the planning horizon increases the long term sustained yield of the Forest. Timber returns in decade one of the departure exceed Alternative H by 31 percent but in decade three, timber returns for the departure exceed Alternative H's timber returns by only 27 percent. By decade five, returns are more similiar.

In spite of the departure opportunities of this alternative, the PNV remains relatively low. This alternative is the same as Alternative H is responsiveness to a variety of non-priced resource management issues, with the exception of the degree to which the timber harvest program incorporates wildlife constraints. The tradeoffs of providing nonmarket resources are reflected in the benefit/cost ratio as well as in PNV.

i. Alternative HA

Alternative HA is exactly the same management alternative as Alternative H, however, the West Pioneer Wilderness Study Area is assigned a variety of non wilderness prescriptions, including a central core area of roadless recreation management (about 62,000 acres) and 55,200 acres that are designated suitable for timber production. As indicated for Alternative H, Alternative HA responds to the variety of resource use demands and concerns of the publics who utilize the Beaverhead NF lands and resources. As in Alternative H, timber harvest for the first four decades is concentrated in areas of lodgepole pine, highly suseptible to infestations of mountain pine beetle. Because of the constraints imposed to achieve non-priced objectives, this alternative has a low PNV but due to the addition of a portion of the West Pioneers to the suitable timber land base, the PNV increases from fourth lowest for Alternative H to fifth lowest.

The costs of implementing Alternative HA are seventh lowest (moderate in the range) of the alternatives considered, $7 million or 5 percent higher than for Alternative H. The discounted benefits associated with this alternative are sixth lowest, about $18 million or 6 percent higher than for Alternative H. The benefit/cost ratio for Alternative HA is sixth lowest of the alternatives considered. Alternatives C,D, S, and SA have higher proportional investments for benefits than Alternative H or Alternative HA.

The opportunity cost of implementing Alternative HA rather than the maximum PNV benchmark is $130 million. Precluding timber management from 46 percent of tentatively suitable timberland, dispersing timber harvest over the Forest, achieving other wildlife habitat maintenance objectives, and emphasizing lodgepole pine harvest in the early decades result in the net timber value of less than 50 percent of the value in the maximum PNV benchmark. Still the timber value of Alternative HA is 11 percent higher than for Alternative H. The timber costs are $10 million less than in the maximum PNV benchmark; road costs are $11 million less than in the maximum PNV benchmark; however, the timber benefits are $150 million less. Nondiscounted livestock grazing returns increase slightly in decade 1 to $275,000 but decrease over time due to a decrease in timber harvest on transitory range.

Alternative HA has a suitable timber base of 433,700 acres, 54 percent of the tentatively suitable timber base and lies in the middle of the range of alternatives. In comparison, the suitable land base of Alternative H is 378,500 acres, a difference of about 55,000 acres. The suitable timber base of Alternative HA is 59 percent of the base associated with the maximum PNV benchmark. The long term sustained yield capacity of Alternative HA is 11.6 MMCF, compared to 17.3 MMCF for the maximum PNV benchmark and 10.4 MMCF for Alternative H. The cost of timber harvest for Alternatives HA and H is higher than for the maximum PNV benchmark due to the constraints imposed to meet wildlife objectives; the smaller suitable land base reducing flexibility; and the emphasis on harvest of the lower value lodgepole pine timber in the early decades. The average discounted net timber value decreases from $374 acre of suitable timberland in the maximum PNV benchmark to $307 acre of suitable timber land in Alternative HA.

Alternative C has the next higher PNV from Alternative HA, $2 million higher. Both the discounted costs and the discounted benefits of C are higher. Alternative I also has a slightly higher PNV that Alternative HA, $12 million higher. Both the discounted costs and discounted benefits of Alternative I are lower than Alternative HA, but the benefit/cost ratio is higher indicating that a more efficient land use and resource production schedule is associated with Alternative I.

The economic consequences of implementing Alternative HA instead of Alternative A (Current Level Management) are a reduction in PNV of $28 million (approximately 13 percent). Discounted costs are higher for timber and "other" costs but road costs are lower. Discounted benefits associated with Alternative HA are $22 million less than in Alternative A. The long term sustained yield capacity is higher in Alternative HA by .8 MMCF however Alternative HA would reduce the suitable timber base from 535,300 acres to 433,700 acres. Lower benefits are in large part due to the emphasis on lodgepole pine harvest.

Alternative HA has a relatively low PNV (although higher than Alternative H) because this alternative attempts to respond to the variety of resource management demands of the public for timber, wilderness and roadless recreation areas, elk security, diversity, water quality, and fish populations--not all of which contribute priced benefits to any calculations of PNV. The tradeoffs of providing nonmarket resources are reflected in the benefit/cost ratio as well as in PNV. The differences between Alternative H and HA are due to the West Pioneers.

j. Alternative I

Alternative I is the maximum wilderness benchmark brought forward in the analysis as an alternative. All lands included in the roadless area inventory are recommended for wilderness classification and modeled as wilderness. Thus 1,415,600 acres would be classified wilderness under this alternative including the two areas already classified (173,500 acres). About 66 percent of the Forest would be wilderness. All other lands are managed with cost efficiency as the primary guide used in the determination of prescription assignment and production schedules. Alternative I has the smallest nonwilderness roadless land base of any of the alternatives; the third highest benefit/cost ratio; and a PNV that is moderate in the range of alternatives considered.

The discounted costs associated with Alternative I are the second lowest of the alternatives considered; higher than only Alternative D which manages for timber production on lands already accessed by roads, a significant contributor to costs. The reasons for the low costs of Alternative I include the substantial assignment of wilderness management prescriptions which have relatively low costs associated with them. A large portion of the remaining area available and capable of timber production is already accessed by roads; in addition on the nonwilderness lands management for timber and range are allowed to proceed with limited constraints that increase management costs. In addition, production of the range or timber resources were not forced, that is, specific production levels were not required as they were in Alternative C. This allowed costs to be the minimum necessary to maximize priced benefits.

The discounted benefits associated with Alternative I are the fifth lowest of the alternatives considered; higher than only Alternatives D, H, S, and SA. The wilderness recreation values that contribute to discounted benefits are essentially the same for all these alternatives, even though Alternative I has substantially more acreage classified as wilderness, because wilderness values are assigned only up to the level that would be used not the level that could be provided. Capacity exceeds demand in all alternatives. Thus the benefits associated with Alternative I that are greater than Alternatives D, H, S, and SA are related to the level of timber harvest that can be programmed from the suitable timber land base and the species of stands that are scheduled for harvest.

The long term sustained yield capacity of Alternative I is 8.3 MMCF (25.7 MMBF), second lowest of the alternatives considered. Alternative D has a lower long term sustained yield capacity and a lower suitable timber land base. As a result, the discounted timber benefits of Alternative D are lower than for Alternative I. The long term sustained yield capacity of Alternatives H, S, and SA are greater than for Alternative I yet the discounted timber benefits are lower. This is because these altnernatives focus harvest on lodgepole pine stands while Alternative I is unconstrained and harvest is scheduled where the benefit/cost ratio will be highest, in the mixed conifer stands.

The opportunity cost associated with Alternative I is $118 million; that is, the difference between maximization of PNV and the objectives of Alternative I is $118 million. This is the sixth lowest opportunity cost, moderate in the array of alternatives considered. The discounted costs of Alternative I are $38 million less than those of the maximum PNV benchmark (24 percent less) while the discounted benefits of Alternative I are $156 million less (34 percent).

The domestic livestock grazing program available under Alternative I is still relatively high because domestic livestock grazing that has historically occurred in a roadless area can continue under wilderness designation an low intensity levels. The average annual AUM's available in decade one are 178,000 AUM's, the lowest of the alternatives considered but only 12,000 AUM's per year less than Alternative A (Current Level of Management). The discounted benefits associated with the range program in Alternative I are the lowest of the alternatives considered ($39 million), $3 million less than under Alternative A but only $2 million less than the discounted range benefits associated with the maximum PNV benchmark.

k. Alternative W

Alternative W is very similiar to Alternative F in that it attempts to provide a moderate to high level of commodity resources while at the same time mitigating the impacts of development of the timber resource by incorporating constraints designed to maintain elk security cover. Alternative W differs from Alternative F in that the inventoried roadless lands recommended for wilderness classification (appromixately 15 percent of the Forest) are those recommended for classfication by the Montana Wildlands Coalition, to the extent that boundary recommendations could be modeled. This alternative ensures that wildlife management prescriptions are assigned to key wildlife areas. Alternative W has the third highest PNV of the alternatives considered but a benefit/cost ratio that is fifth best of the alternatives. As in Alternative F, relatively high costs are involved in attaining the dollar benefits associated with this alternative but the high production level for timber assures a relatively high PNV.

The discounted costs associated with implementation of this alternative are moderately high in the range of alternatives considered. Timber discounted costs are sixth highest; road construction costs are second highest (reflecting the efforts to distribute the harvest over the entire suitable timber land base to ensure protection of elk security cover over time); and the "other costs" that include wildlife costs are the second highest of the alternatives considered. Total discounted costs are 6 percent less than the total discounted costs associated with the maximum PNV benchmark.

The discounted benefits associated with Alternative W are moderate in the array of alternatives considered. The primary difference between this alternative and the others is associated with the timber program; timber discounted benefits are third highest of the alternatives considered (and very similiar to Alternative F). The discounted benefits of Alternative W are 22 percent less than the discounted benefits of the maximum PNV benchmark.

The opportunity costs associated with implementation of Alternative W instead of the maximum PNV benchmark is $91 million, a lower opportunity cost than is associated with most of the other alternatives. The benefit/cost ratio of Alternative W--2.39-- can be compared to the benefit/cost ratio of the maximum PNV benchmark--2.89. The benefit/cost ratio could be improved with the removal of constraints designed to protect the wildlife resource or through an increase in the suitable timber land base. Alternative W has a suitable land base of 615,800 acres, second largest of the alternatives considered. This land base is 76 percent of the tentatively suitable land base and 84 percent of the suitable lands determined to be economically suitable in the maximum PNV benchmark. The large suitable land base and the relatively high level of timber harvested (long term sustained yield capacity of 11.5 MMCF--35.7 MMBF) contribute to the high PNV.

Like Alternative F, Alternative W has a less economically efficient land use and timber harvest schedule than Alternative A (Current Level Management) once a budget constraint has weeded out some of the less efficient prescription assignments of the 1978 Land Management Plan. This is largely because of the wildlife constraints impacting the scheduling of timber harvest and because of the wildlife costs. Still, the PNV of Alternative W is higher than the PNV of

ALternative A because the long term sustained yield capacity of Alternative W is higher.

1. **Alternative S**

Alternative S was built from Alternative H following public review of the Revised Draft Environmental Impact Statement. Like Alternative H this alternative responds to the variety of resource use demands and concerns of the publics who utilize the Beaverhead NF lands and resources. However, due to public comments received on the Revised Draft relative to the Proposed Action and further assessment of the appropriate mix of resource uses for the Beaverhead National Forest, some changes were made in Alternative H.

This alternative provides the highest level of roadless recreation opportunities of any of the alternatives considered, as well as recommendations for wilderness classification in some of the inventoried roadless areas receiving highest public support for classification. Wildlife concerns are also addressed through constraints on the spacial and temporal distribution of the timber program and through maintenance of the roadless, undisturbed qualities of some areas will high wildlife habitat values. Timber harvest is well distributed across all the land types and tree species that make up the suitable timber land base. This precludes all harvest in the early decades being only the higher value species and allow harvest to focus on the lodgepole stands, which are highly suceptible to infestations of mountain pine beetle. Alternative S assigns the entire West Pioneer Wilderness Study Area to custodial management, pending a decision by Congress regarding wilderness classification. Because of the constraints imposed to achieve non-priced objectives, this alternative has the second lowest PNV.

The costs of implementing Alternative S are third lowest of the alternatives considered. The discounted benefits associated with this alternative are second lowest, indicating a higher cost for benefits produced than for several of the other alternatives. In part this is because Alternative S uses higher cost prescriptions to achieve resource development opportunities, such as timber harvest, with mitigation of impacts on other resources, such as wildlife habitat improvements. Consideration of costs and benefits should be done with the timber havest volume in mind; this alternative has the third lowest long term sustained yield capacity. The benefit/cost ratio for Alternative S is second lowest of the alternatives considered. Alternative C has higher proportional investments for benefits received than Alternative S.

The opportunity cost of implementing Alternative S rather than the maximum PNV benchmark is $158 million. Precluding timber management from 58 percent of tentatively suitable timberland, dispersing timber harvest over the Forest spacially and over time so that hiding cover can be obtained prior to additional harvest in an area, achieving other wildlife habitat maintenance objectives, and emphasizing lodgepole pine harvest in the early decades result in the net timber value of only 37 percent of the value in the maximum PNV benchmark. The timber costs are 47 percent less than in the maximum PNV benchmark; road costs are 52 percent less than in the maximum PNV benchmark.

Alternative S has a suitable timber base of 338,300 acres, 46 percent of the economically suitable timber base and the second smallest base of the alternatives. The suitable timber base of this alternative is 42 percent of the tentatively suitable timber base associated with the maximum timber benchmark. The long term sustained yield of Alternative S is 9.3 MMCF, compared to 17.3 MMCF for the maximum PNV benchmark. The cost of timber harvest for Alternative S is higher than for the maximum PNV benchmark due to the constraints imposed to meet wildlife objectives; the smaller suitable land base reducing flexibility; the use of higher cost prescriptions; the spread of timber harvest across all types of lands, including cable ground in the first decades; and the emphasis on harvest of the lower value lodgepole pine timber in the early decades. The average discounted net timber value decreases from $374 acre of suitable timberland in the maximum PNV benchmark to $296 acre of suitable timber land in Alternative S.

Alternative SA has slightly higher discounted costs than Alternative S, just as Alternative HA has slightly higher costs than Alternative H. Alternative SA is discussed in detail below; but briefly, the increased investment is associated with management activities scheduled for the West Pioneers. These investments in the timber and road construction programs result in higher discounted benefits and a PNV that is $2 million greater. The difference betweeen S and SA is less than the difference between H and HA because HA has more of the West Pioneers within the suitable timber base than SA does.

Alternative H has the next higher PNV from Alternative S (with the exception of Alternative HA), $17 million higher. The discounted costs of Alternative H are $4 million higher while the discounted benefits are $22 million higher. The benefit/cost ratio is also higher. There are more constraints on the timber harvest program in Alternative S than in Alternative H, including costly items like requiring harvest of costly cable ground in the first decades, and a temporal constraint on the harvest of existing stands of timber to ensure that hiding cover is provided over time throughout the suitable timber base where wildlife habitat values are high.

The economic consequences of implementing Alternative S instead of Alternative A (Current Level Management) are a reduction in PNV of $56 million (approximately 29 percent). Discounted costs are less (by about $5 million) but discounted benefits associated with Alternative S are 19 percent less than in Alternative A. The long term sustained yield is less for Alternative S than for Alternative A. And the suitable timber base is reduced from 535,300 acres to 338,300 acres. Lower benefits are in large part due to the emphasis on lodgepole pine harvest, nonpriced resources, and a well distributed harvest program. All costs are lower with the exception of "other" resource costs which are higher reflecting the emphasis of this alternative on wildlife, recreation, and roadless resource values.

Alternative S has a relatively low PNV because this alternative attempts to respond to the variety of resource management demands of the public for timber, wilderness and roadless recreation areas, elk security, diversity, water quality, and fish populations--not all of which contribute priced benefits to any calculations of PNV. The PNV is lower than it is for Alternative H because the public feedback provided between the Revised Draft and the Final EIS in combination with review of the mangement opportunities and issues on the Beaverhead National Forest led to formulation of a new Proposed Action with somewhat different land designations and resource production schedules. The tradeoffs of providing nonmarket resources are reflected in the benefit/cost ratio as well as in PNV.

m. Alternative SA

Alternative SA is exactly the same management alternative as Alternative S, however, the West Pioneer Wilderness Study Area is assigned a variety of non-wilderness prescriptions, including a roadless recreation management prescription that encompasses about 90 percent of the area. There are also about 20,000 acres that are suitable for timber management around the edges of the study area as well as some acres assigned to other management emphases that do not allow scehduled timber harvest and that emphasis wildlife management objectives or a custodial level of management. Alternative SA was built following public review of the Revised Draft Environmental Impact Statement. It is similiar to HA in that HA is just like H with the exception being in the West Pioneers. Like Alternative HA this alternative responds to the variety of resource use demands and concerns of the publics who utilize the Beaverhead NF lands and resources. However, due to public comments received on the Revised Draft relative to the Proposed Action and further assessment of the appropriate mix of resource uses for the Beaverhead National Forest, some changes were made in Alternative HA.

This alternative provides the fourth highest level of roadless recreation opportunities of any of the alternatives considered, as well as recommendations for wilderness classification in some of the inventoried roadless areas receiving highest public support for classification. Wildlife concerns are also addressed through constraints on the spacial and temporal distribution of the timber program and through maintenance of the roadless, undisturbed qualities of some areas will high wildlife habitat values. Timber harvest is well distributed across all the land types and tree species that make up the suitable timber land base. This precludes all harvest in the early decades being only the higher value species and allow harvest to focus on the lodgepole stands, which are highly suceptible to infestations of mountain pine beetle. Because of the constraints imposed to achieve non-priced objectives, this alternative has the third lowest PNV, just slightly higher than the PNV for Alternative S.

The costs of implementing Alternative SA are fourth lowest of the alternatives considered. The discounted benefits associated with this alternative are third lowest, indicating a higher cost for benefits produced than for several of the other alternatives. In part this is because like Alternative S, Alternative SA uses higher cost prescriptions to achieve resource development opportunities, such as timber harvest, with mitigation of impacts on other resources, such as wildlife habitat improvements. Consideration of costs and benefits should be done with the timber havest volume in mind; this alternative has the third lowest long term sustained yield capacity. The benefit/cost ratio for Alternative SA is third lowest of the alternatives considered. Alternatives S and C have higher proportional investments for benefits received than Alternative SA. The additional timber volume available for management in Alternative SA versus Alternative S gives the former a benefit/cost ratio of 2.11 while the latter has a benefit/cost ratio of 2.10.

The opportunity cost of implementing Alternative S rather than the maximum PNV benchmark is $155 million. Precluding timber management from 56 percent of tentatively suitable timberland, dispersing timber harvest over the Forest spacially and over time so that hiding cover can be obtained prior to additional harvest in an area, achieving other wildlife habitat maintenance objectives, and emphasizing lodgepole pine harvest in the early decades result in the net timber value of only 39 percent of the value in the maximum PNV benchmark. The timber costs are 44 percent less than in the maximum PNV benchmark; road costs are 40 percent less than in the maximum PNV benchmark.

Alternative SA has a suitable timber base of 360,300 acres, 49 percent of the economically suitable timber base and the fourth smallest base of the alternatives. The suitable base is 20,000 acres larger than for Alternative S. The suitable timber base of this alternative is 44 percent of the tentatively suitable timber base associated with the maximum timber benchmark. The long term sustained yield of Alternative SA is 9.8 MMCF, compared to 17.3 MMCF for the maximum PNV benchmark and 9.3 MMCF for Alternative S. The cost of timber harvest for Alternative SA is higher than for the maximum PNV benchmark due to the constraints imposed to meet wildlife objectives; the smaller suitable land base reducing flexibility; the use of higher cost prescriptions; the spread of timber harvest across all types of lands, including cable ground in the first decades; and the emphasis on harvest of the lower value lodgepole pine timber in the early decades. The average discounted net timber value decreases from $374 acre of suitable timberland in the maximum PNV benchmark to $292 acre of suitable timber land in Alternative SA. This compares to $296 acre for Alternative S.

Alternative SA has slightly higher discounted costs than Alternative S, just as Alternative HA has slightly higher costs than Alternative H. Alternative SA is discussed in detail below; but briefly, the increased investment is associated with management activities scheduled for the West Pioneers. These investments in the timber and road construction programs result in higher discounted benefits and a PNV that is $2 million greater. The difference betweeen S and SA is less than the difference between H and HA because HA has more of the West Pioneers within the suitable timber base than SA does.

Alternative H has the next higher PNV from Alternative SA, $17 million higher. The discounted costs of Alternative H are $2 million higher while the discounted benefits are $16 million higher. The benefit/cost ratio is also higher. There are more constraints on the timber harvest program in Alternative SA than in Alternative H, including costly items like requiring harvest of costly cable ground in the first decades, and a temporal constraint on the harvest of existing stands of timber to ensure that hiding cover is provided over time throughout the suitable timber base where wildlife habitat values are high.

The economic consequences of implementing Alternative SA instead of Alternative A (Current Level Management) are a reduction in PNV of $53 million (approximately 27 percent). Discounted costs are less (by about $3 million) but discounted benefits associated with Alternative SA are 17 percent less than in Alternative A. The long term sustained yield is less for Alternative SA than for Alternative A by about 1 MMCF. And the suitable timber base is reduced from 535,300 acres to 360,300 acres. Lower benefits are in large part due to the emphasis on lodgepole pine harvest, nonpriced resources, and a well distributed harvest program. All costs are lower with the exception of "other" resource costs which are higher reflecting the emphasis of this alternative on wildlife, recreation, and roadless resource values.

Alternative SA has a relatively low PNV because this alternative attempts to respond to the variety of resource management demands of the public for timber, wilderness and roadless recreation areas, elk security, diversity, water quality, and fish populations--not all of which contribute priced benefits to any calculations of PNV. The PNV is lower than it is for Alternative HA because the public feedback provided between the Revised Draft and the Final EIS in combination with review of the mangement opportunities and issues on the Beaverhead National Forest led to formulation of a new Proposed Action with somewhat different land designations and resource production schedules. The tradeoffs of providing nonmarket resources are reflected in the benefit/cost ratio as well as in PNV.

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Alternative [illegible] has a relatively low NPV because this alternative attempts to respond to the variety of resource management demands of the public for timber, wilderness and roadless recreation areas, elk security, diversity, water quality, and fish populations--not all of which contribute priced benefits to NPV calculations of [illegible]. The NPV is lower than it is for Alternative [illegible] because the public feedback received between the Draft and the Final EIS in combination with review of the management opportunities and issues on the [illegible] National Forest led to formulation of a new Proposed Action with somewhat different land designations and resource production schedules. The [illegible] of [illegible] by [illegible] are reflected in the [illegible] [illegible] as well as in PNV.

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